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ABSTRACT

To address problems that the campus faces when attempting to make facility modifications that meet federal handicap accessibility requirements, this guidebook gives guidance on requirements and methods of "retrofitting" that meet the mobility needs of the disabled. Seven chapters discuss modifications to site, entrance, doors, interior circulation, restrooms, drinking fountains, and special spaces. Each chapter is further divided into three sections. The first section uses a mandatory evaluation requirements checklist, drawings, and text to aid in evaluation of existing facilities to see if they provide accessibility for the disabled. The second section presents architectural construction drawings as solutions to common problems found in existing facilities. The drawings can also be used in new construction. The third section includes architectural specifications. An appendix discusses useful tools and procedures for the facility survey. (DCS)

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Modifying the Existing Campus Building for Accessibility:

Construction Guidelines and Specifications

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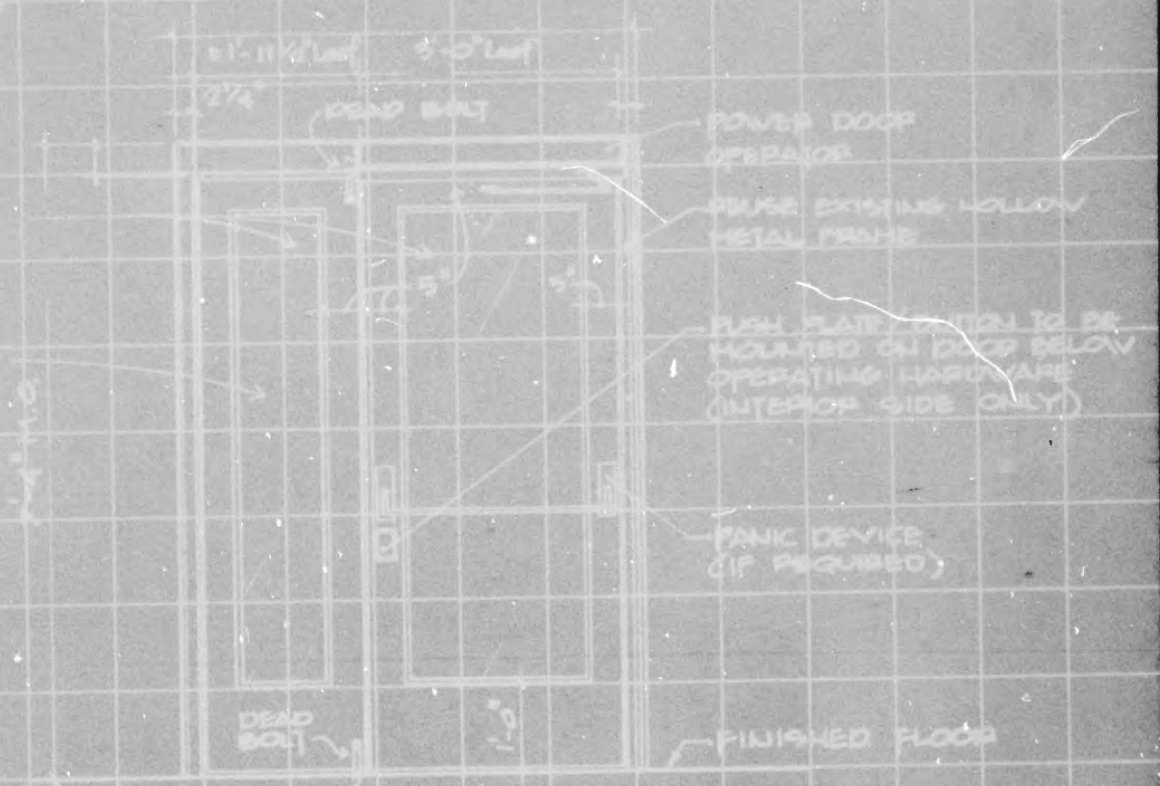
by Stephen Richard Cotler, Architect


POWER DOOR OPERATOR
REUSE EXISTING HOLLOW METAL FRAME
PUSH PLATE - ON TO BE MOUNTED ON DOOR BELOW OPERATING HARDWARE (INTERIOR SIDE ONLY)
PANIC DEVICE (IF REQUIRED)
DEAD BOLT
FINISHED FLOOR

The Association of Physical Plant Administrators of Universities and Colleges

EA 017 396

Modifying the Existing Campus Building for Accessibility:

Construction Guidelines and Specifications

by Stephen Richard Cotler, Architect

The Association of Physical Plant Administrators
of Universities and Colleges

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Preface

Mandates for Accessibility

Several federal and many state laws and codes require that buildings be accessible to the physically handicapped. The passage of the Rehabilitation Act of 1973 (Public Law 93-112) broadened the coverage of accessibility requirements affecting higher education. Section 504 of this Act states: "No otherwise qualified handicapped individual in the United States . . . shall, solely by reason of handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

HEW's regulations implementing Section 504 became effective on June 3, 1977, and require recipients of HEW funds to make all programs and services accessible to qualified handicapped individuals. To accomplish this, retrofit of existing buildings may be necessary. This publication addresses those problems that the campus faces when attempting to make these modifications. It has been found that many "retrofits" for accessibility do not make the buildings truly accessible, because the designer did not fully understand the needs of the disabled. Modifications such as curb cuts, which have been constructed using too steep an angle and an abrupt edge at the street level, can actually be more dangerous to the disabled person than no curb cuts at all. This publication will help you create an affordable accessible environment by giving guidance on requirements and methods of retrofitting that meet the needs of the disabled.

An Overview of Section 504 and Other Laws

Structural modifications do not have to be made on every campus building. They do have to be made where programs are offered. The concept of program accessibility, a key term in Section 504, ensures that all federally assisted programs and activities, when viewed on their entirety, are accessible to handicapped persons. Program accessibility does not require that all existing facilities be made accessible, so long as the programs and activities, as a whole, are accessible. Thus a college or university may provide for full participation for handicapped students, staff, and faculty without renovating every existing classroom building, office space, or residence hall. This requirement for *program* rather than *facility* accessibility may relieve some schools from the necessity of extensively renovating structures. If, however, a building houses programs or activities not available elsewhere, or serves a ceremonial or traditional function that can be considered part of the institution's program, then physical access for handicapped individuals may be required.

In addition, the regulation requires that any alterations made to a facility or part of a facility that could affect the usability of the building must "to the maximum extent feasible" make the altered facility or portion of the facility accessible to and usable by handicapped persons. For example, if a doorway or wall is being altered, the door or new wall opening must provide the necessary clearance to accommodate people in wheelchairs. If, on the other hand, the roof were being replaced, there would be no requirement for accessibility features since the alterations cannot be done in a way that would affect accessibility of the building. This requirement, which applies to any alterations undertaken after June 3, 1977, could affect a significant number of campus buildings as older structures are systematically rehabilitated.

Presidential Executive Order 11914 of 1976 concerning Section 504 mandated all federal agencies that extend financial assistance to recipients to develop, publish, and implement Section 504 regulations. Further, it directed the Department of Health, Education, and Welfare (HEW) to develop guidelines for agency review to ensure the consistency of these regulations.

Executive Order 11914 was superseded on November 2, 1980 by Executive Order 12250 which consolidated all civil rights coordinating authority in the Department of Justice. The impact on Section 504 is significant because the Department of Health and Human Services (successor to HEW) no longer has the responsibility for coordinating the development of the regulations. This new Executive Order expands the responsibility to include coordinating the implementation of the regulations and technical assistance and training. If an institution is receiving funding from several federal agencies, it should contact the Office of Coordination and Review within the Department of Justice to resolve any inconsistencies of overlapping Section 504 regulations.

Another federal law that might have applicability on campuses is the Architectural Barriers Act of 1968, which requires that all buildings and facilities owned, occupied, or financed by the United States government be accessible to and usable by handicapped persons. Specifically, this law applies to buildings and facilities designed, constructed, altered, or leased by the federal government after August 12, 1968, and to those whose construction was financed wholly or in part with federal funds. Responsibility for establishing accessibility standards for all such buildings and facilities is assigned to the Administrator of General Services, the United States Postal Service, and the Secretaries of the Departments of Housing and Urban Development and Defense, in consultation with the Secretary of Health, Education and Welfare. Enforcement of compliance rests with the federal agencies and the Architectural and Transportation Barriers Compliance Board.

This act would apply to construction funded through federal programs such as the Higher Education Facilities Act and the College Housing Loan Program. In September 1969, the General Services Administration and several federal agencies adopted ANSI A117.1 as the standard for compliance. Therefore, most facilities constructed since September 1969 with federal support must comply with ANSI A117.1 (1961, R 1971).

In January 1981 the Architectural and Transportation Barriers Compliance Board (ATBCB) adopted a new minimum accessibility guideline. The Architectural Barriers Act implies that the four standard-setting agencies previously mentioned must conform to ATBCB's minimum guideline. The consequence of this implication is that if your campus receives federal construction money, you will be under the regulations of one or more of the standards set by the standard-setting agencies. If your campus is using any federal monies for construction, you should stay abreast of any regulatory action taken on this subject. You should also study the intricacies of the Architectural Barriers Act.

It is possible that a particular facility on your campus is subject to compliance under both Section 504 and the Architectural Barriers Act. For example, an inspector for Section 504 compliance could review a facility on your campus and recommend that you spend $5,000 to modify the building to meet 504 requirements, making both architectural and program modifications. Then after the retrofit was completed, an inspector from ATBCB could find that the building was not built to agency standards established by the Architectural Barriers Act. It might cost your campus approximately $100,000 to retrofit this facility to meet the Act's requirements. Again, it should be emphasized that it is the campus administrator's responsibility to understand the possible overlap of these laws because the different enforcement agencies might or might not be aware of other federal jurisdiction.

In addition, many states and local jurisdictions have some type of law on the books regarding architectural barriers. Most of these laws preceded passage of federal legislation. The coverage of these laws varies greatly. Some legislation covers only state-owned or state-funded new construction; some requires accessibility features to be included in any major alterations for such projects; and still others call for accessibility in all publicly used buildings, such as theaters, restaurants, hotels, multifamily residential units, and similar commercial, industrial, or health installations.

Standards and Codes

Federal, state, and local accessibility requirements are implemented through the application of design specifications or standards, generally enforced by means of building codes. The American National Standards Institute (ANSI A117.1), "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," is the original, and still most widely used, accessibility standard. First issued in 1961 and reissued without change in 1971, the original edition is officially designated as ANSI A117.1-1961 (R 1971). An extensive research project, conducted from 1974 to 1979, has culminated in a revised and expanded document, ANSI A117.1 (1980).

ANSI standards do not have the force of law. They are, rather, a recommended set of *minimum* design criteria established to serve as the basis for codes and regulations. The purpose of ANSI A117.1 is to specify a uniform set of minimum requirements below which the detailed requirements of codes and regulations should not fall.

A standard has the force of law only when it is specifically referenced in a building code, regulation, or legislative act. Following its issuance in 1961, ANSI A117.1 was adopted in many of the building codes, regulations, and state accessibility laws. It has also been adopted by many federal agencies: it is the standard for design of new facilities and alterations referenced in HEW's Section 504 regulations. Wherever ANSI A117.1-1961 (R 1971) is referenced—as it is in HEW's regulation—the 1980 revision will not apply unless and until each regulation, code, or statute is amended to include it.

If there are several applicable requirements, compliance with the stricter code, where a difference exists, usually ensures compliance with the less stringent requirement. In addition, most state and local codes, as well as HEW's regulations for implementing Section 504, provide for approval in the referenced standard, if equivalent or better access is provided by the alternate means.

Although many building codes are based on one of three major codes and most accessibility requirements follow ANSI A117.1-1961 (R 1971) relatively closely, it is impossible to generalize about local code requirements. Most codes differ, if not in design specifications, then in scope and coverage of the accessibility requirements.

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I would like to mention Richard Anderson and Maggie Coons, both formerly with APPA, without whose support this project would not have been a reality.

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Stephen R. Cotler

Introduction

This publication is divided into seven chapters, each of which is further divided into three sections. The section divisions for each chapter are explained below:

Section A/Evaluating Criteria: With drawings, text, and checklists, existing facilities can be evaluated to see if they provide accessibility for disabled individuals. Section A provides information enabling the user to investigate an existing campus building and to determine whether a person with a disability can enter and use the interior spaces required for Section 504 program accessibility. It must be emphasized that the criteria contained in this first section, if followed, do not provide a barrier-free environment, but ensure that those items essential for basic accessibility are met. *The criteria used for evaluating existing buildings are not meant to be used for either the modification of existing facilities or for new construction but solely to measure the existing building to determine if it meets the basic needs of disabled individuals.*

Mandatory evaluation requirements are outlined in checklist form (☑) at the beginning of the section. Other information is shown for a better overview of the problems encountered when modifying a building.

If an existing facility on your campus does not meet the Section A evaluating criteria, you can correct the problem by using the drawings (Section B) and specifications (Section C) found in each chapter.

Section B/Solutions: Architectural construction drawings are presented in Section B as solutions to common problems typically found in existing facilities. These solutions meet the new ANSI A117.1 1980 Standard as well as many other standards found across the country. *It is emphasized that before these drawings are used, they should be reviewed by an architect to assure compliance with local environmental conditions and building codes.* Although these drawings have been created for modification, they can also be used for details in new construction.

Section C/Solutions: Those areas requiring written specifications are included in Section C, Architectural Specifications. As with the drawings, the specifications can be used for both new and modification work. *They, too, should be reviewed by a licensed professional for appropriateness.*

Costs

Costs play an important part in complying with Section 504. Because of the detailed information and the years of experience required for someone to make an accurate cost projection of construction work, we are not attempting to provide cost information. This book is published and intended to be used along with *Modifying the Existing Campus Building for Accessibility: Accessible Products Catalog*. The *Accessible Products Catalog* provides a range of costs for products listed.

Chapter 1

SITE

A Path of Travel

To be considered accessible, a path of travel must meet the following requirements:

- ☑ minimum of 48 inches wide
- ☑ firm and stable material
- ☑ meet changes of level with curb cuts
- ☑ slope of 1:20 or less (paths having a slope greater than 1:20 are considered ramps)
- ☑ vertical drops no greater than ½ inch
- ☑ have a non-slip surface

Curb Cuts

To be considered accessible, curb cuts shall:

- ☑ not have a slope greater than 1:12
- ☑ not have an abrupt drop of more than ½ inch at the intersection of the street and curb cut
- ☑ have flared sides if pedestrians are likely to approach from the side
- ☑ if sides are flared, slope no steeper than 1:8

Parking Spaces

Parking spaces signed and reserved for the disabled shall:

- ☑ have a level transfer area adjacent to the car of not less than 4 feet
- ☑ be as close as possible to the accessible entrance of the building served and connected by an accessible path to that building
- ☑ not require crossing behind vehicles

Gratings

- ☑ If located in walking surface, they shall not have spaces greater than ½ inch wide in one direction.

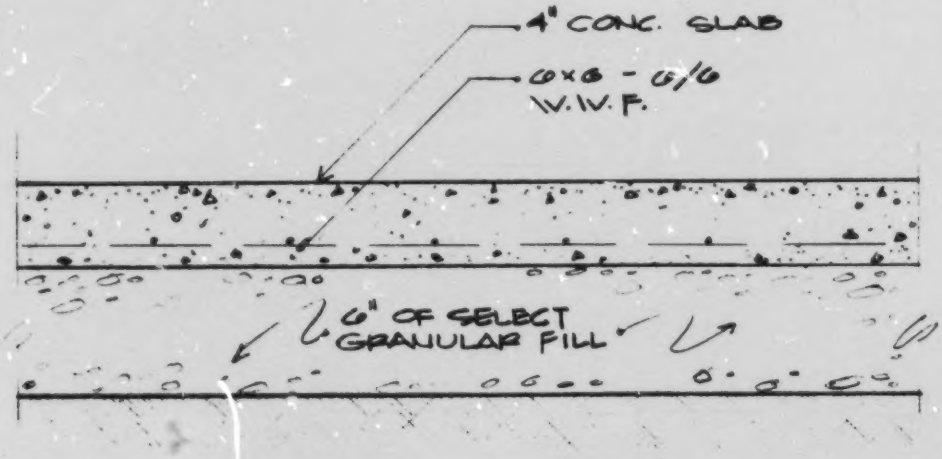
Certain aspects of the site cannot be ignored if the building and its programs are to be considered accessible. Once the accessible building entrance is chosen, it is important to assure that a person with a mobility disability can get to the facility. This path of travel has to originate from one of three places: a vehicular drop-off spot and/or parking spot, and/or an accessible path of travel linking the building with another accessible building.

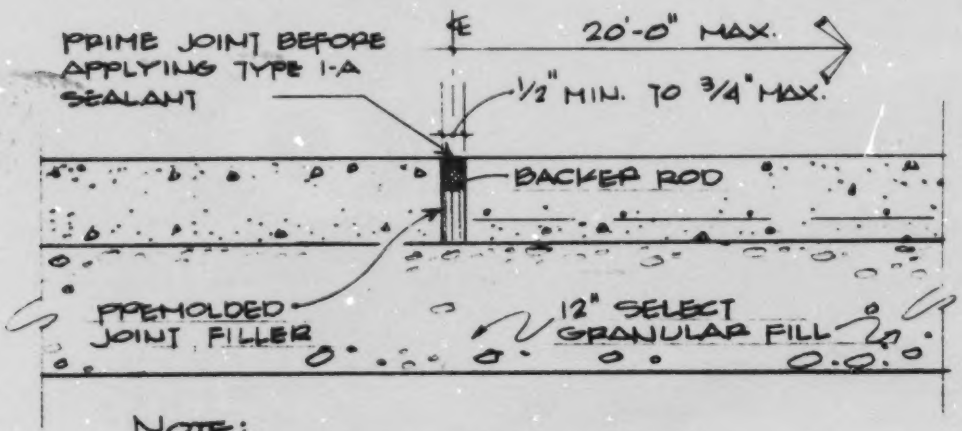
If this path of travel crosses a roadway, curb cuts will be required so that there is a smooth transition between the two levels. The maximum slope for a curb cut is 1:12. If this slope is steeper, a person using a wheelchair could be thrown backward as he or she moves up the curb cut. The lip at the street/curb cut intersection should not be any higher than ½ inch. If traffic is likely to approach this curb cut from a 90° angle to the slope section, the sides should be flared (minimum slope of 1:8). The surface of the curb cut should have a rough broom finish to provide it with texture to alert a blind person that he or she is approaching the street.

For a path of travel to be considered accessible, it must be stable, firm, and without broken areas that create vertical drops of more than ½ inch. Also there should be no abrupt drop-offs to the sides of these paths. The minimum width of an exterior path should not be less than 4 feet. The slope of this accessible path should not exceed 1:20. (If the slope exceeds 1:20, then it will be considered a ramp and will have to meet requirements for ramps which are given in the next chapter.)

There should be no gratings in these paths of travel but if there is an existing one, the openings in one direction should not be greater than ½ inch. If the openings are elongated, the placement of the grating should be so that the long dimension is perpendicular to the dominant direction of travel.

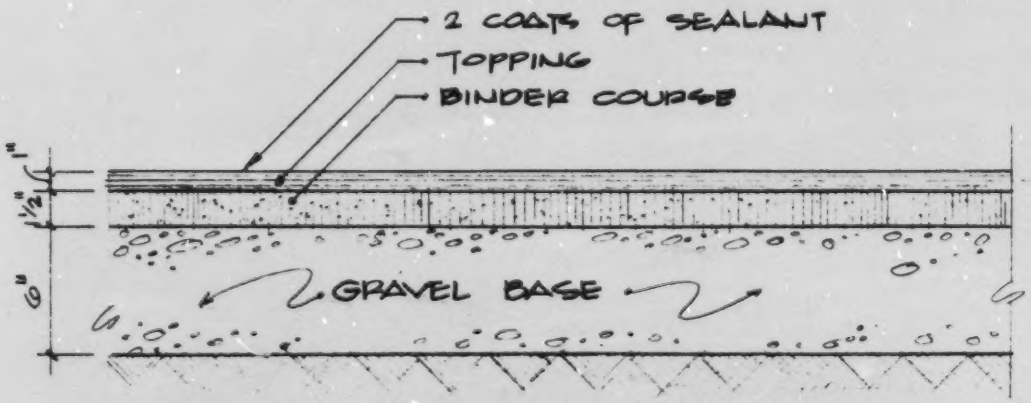
2





NOTE:
TYPICAL JOINT WHERE NEW WALKS ABUT EXISTING WALKS, WALLS RAMPS, STAIRS.

TYPICAL NEW CONCRETE WALK DETAILS
Scale: 1½'' = 1'-0''



TYPICAL ASPHALT PAVEMENT DETAIL
Scale: 1½'' = 1'-0''

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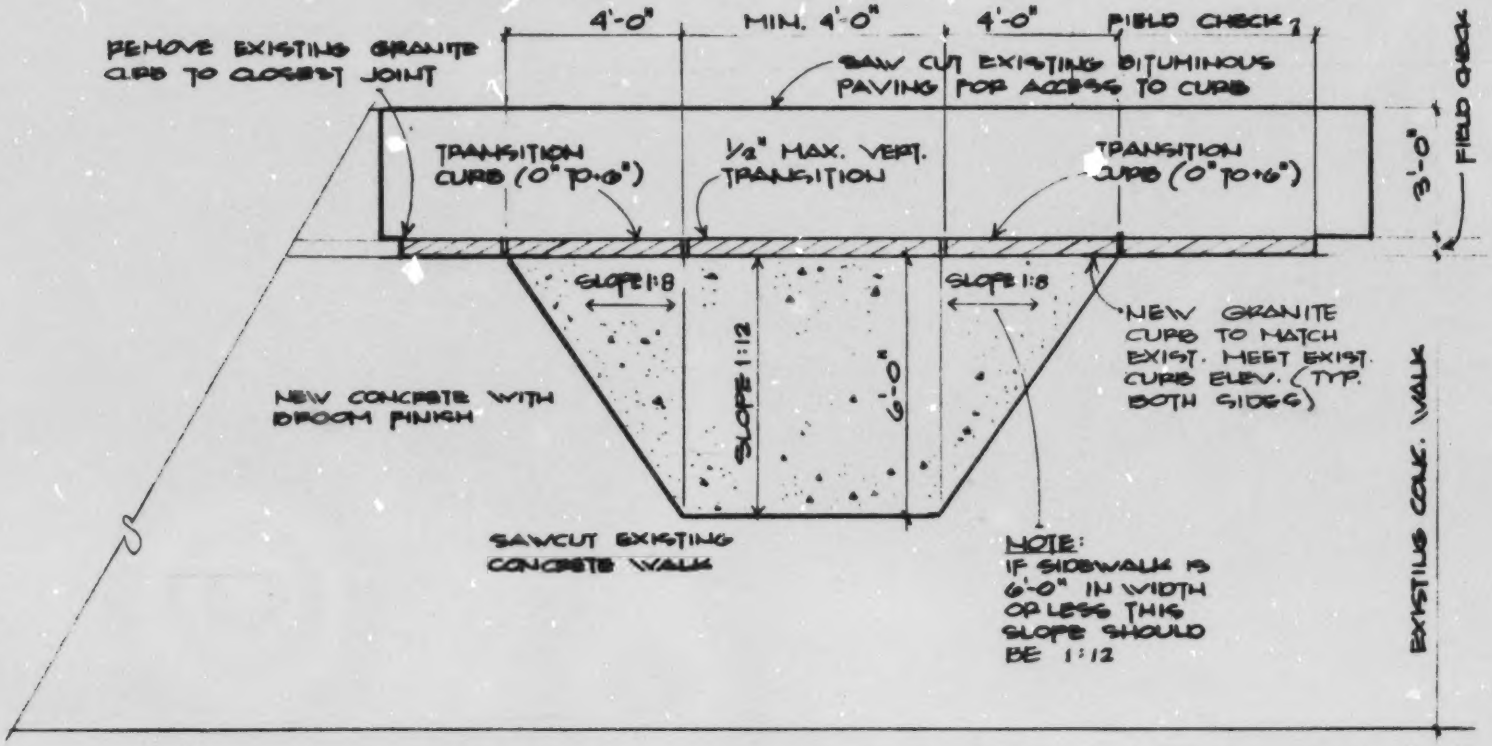
4'-0"
MIN. 4'-0"
4'-0"
FIELD CHECK
REMOVE EXISTING GRANITE CURB TO CLOSEST JOINT
SAW CUT EXISTING BITUMINOUS PAVING FOR ACCESS TO CURB
TRANSITION CURB (0" TO 6")
½" MAX. VERT. TRANSITION
TRANSITION CURB (0" TO 6")
6'-0"
FIELD CHECK
SLOPE 1:8
SLOPE 1:12
6'-0"
SLOPE 1:8
NEW GRANITE CURB TO MATCH EXIST. MEET EXIST. CURB ELEV. (TYP. BOTH SIDES)
NEW CONCRETE WITH BROOM FINISH
EXISTING CONC. WALK
SAWCUT EXISTING CONCRETE WALK
NOTE:
IF SIDEWALK IS 6'-0" IN WIDTH OR LESS THIS SLOPE SHOULD BE 1:12

TYPICAL CURB CUT-OUT DETAIL (6'' ± CURB)
Scale: ¼'' = 1'-0''

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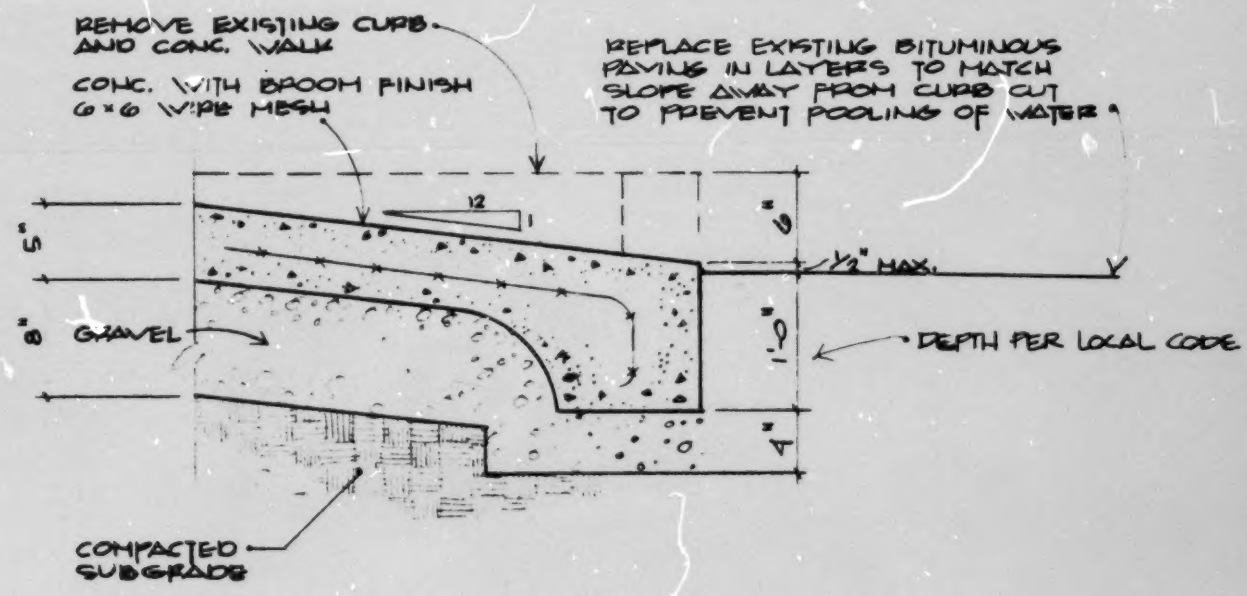

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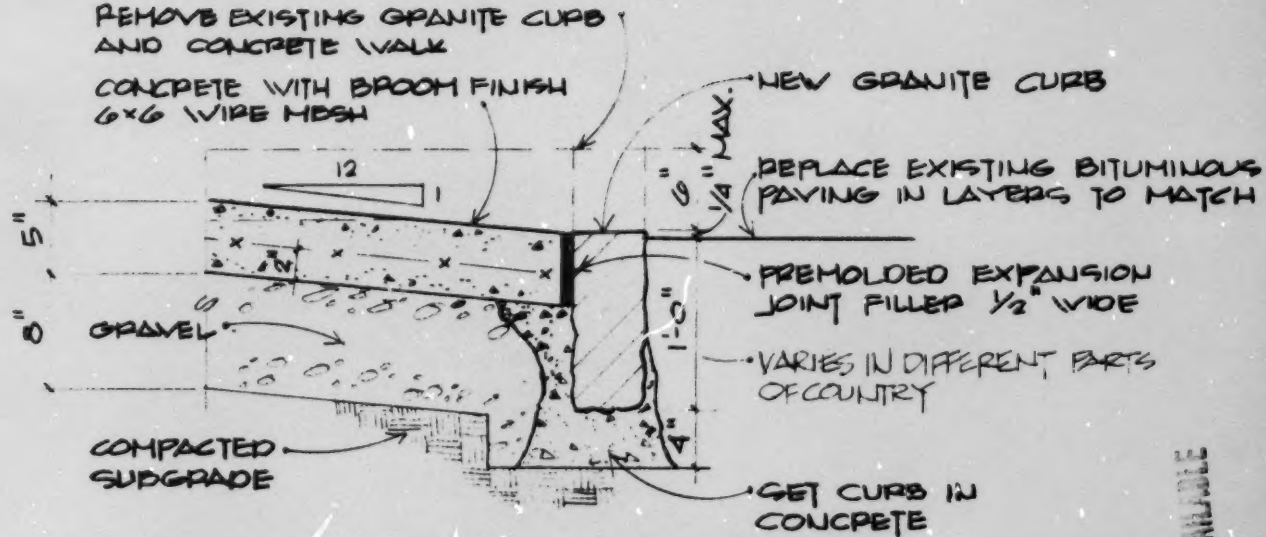
DETAIL CURB CUT
Scale: 1" = 1'-0"



DETAIL CURB CUT
Scale: 1" = 1'-0"

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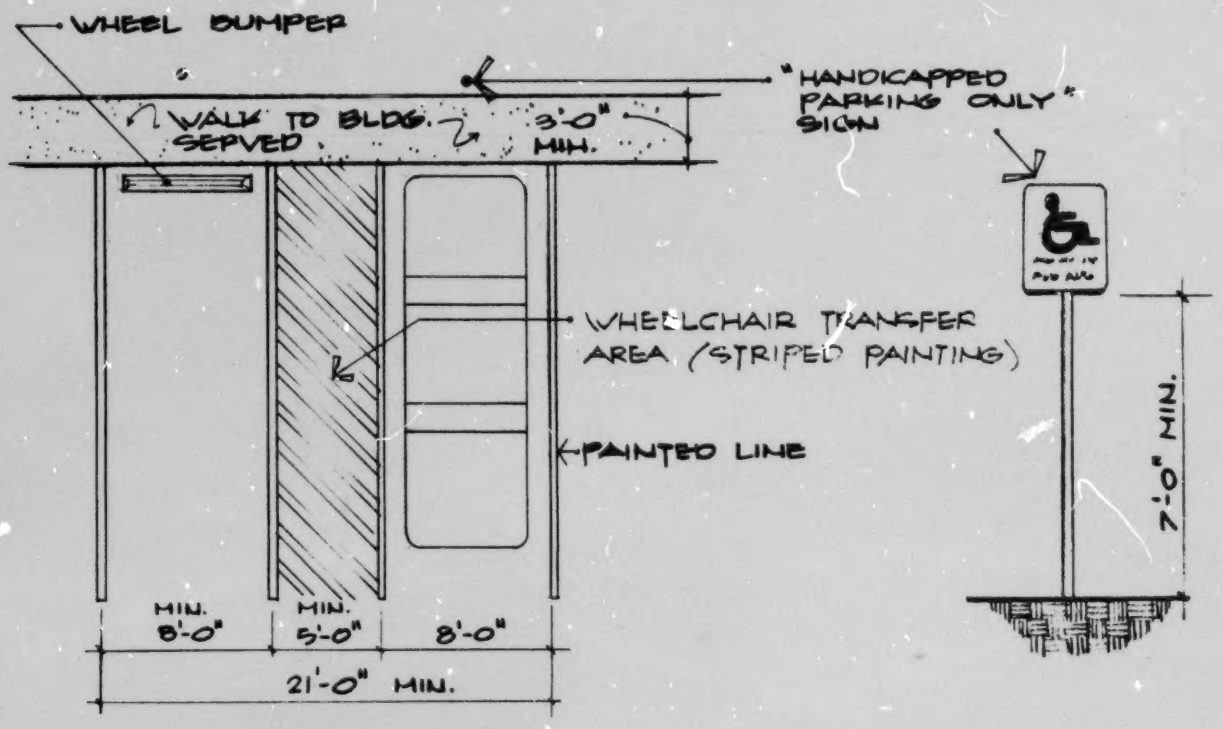
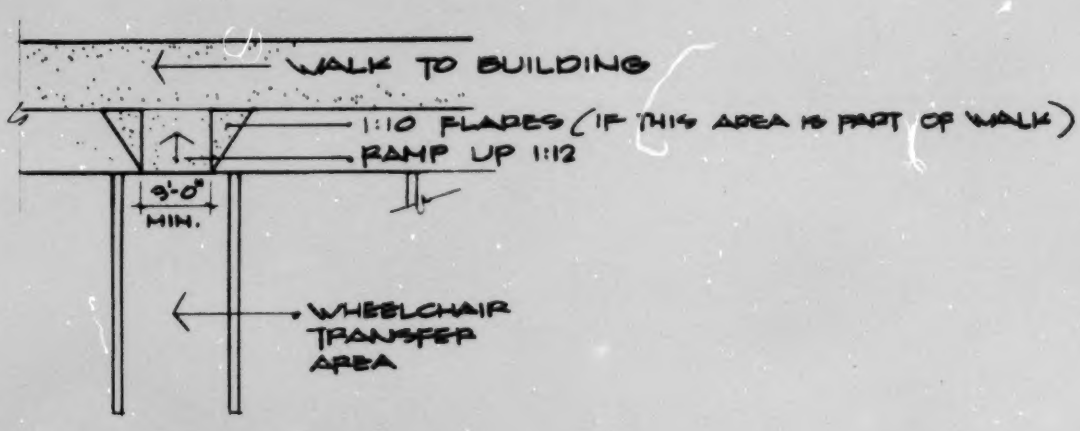


5

PARKING AT SAME LEVEL AS TRAVEL PATH
(TWO ACCESSIBLE PARKING SPACE SHARE SINGLE WHEELCHAIR TRANSFER AREA)



CONNECTION AT PARKING SPACE AND PATH OF TRAVEL WHEN THERE IS A CHANGE OF LEVEL

PARKING REQUIREMENTS

Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Chapter 2

ENTRANCE

Selection of the Accessible Entrance

When selecting the accessible entrance, you should take several points into consideration. The entrance should be either accessible at the time of the inspection or be the one most easily made accessible (i.e., choose an entrance with one step rather than six). But, in some instances, you might have to evaluate several entrances to determine which is the best. If the one you have chosen does not provide accessibility to major parts of the building or if it is located on the opposite side of the building from the major exterior campus circulation routes, you may have to select another entrance.

Number and Types of Entrances

At least one major or primary entrance shall be provided when modifying an existing building to make it accessible to the handicapped. A major or primary entrance is defined as:

☑ Any access point to a building, portion of a building or facility used for the purpose of entering, but does not include doors to fire stairways, other emergency exits, or doors used for servicing the building, unless so designated and qualified as a primary entrance.

☑ It shall be reached by an accessible route of travel from a parking lot, public sidewalk, or vehicle drop-off point.

☑ Entrances shall not be placed where the interior path of travel would lead through hazardous or service areas such as kitchens, mechanical spaces, trash storage rooms, shops, etc.

More than one accessible primary entrance per building is required if:

☑ There is no elevator in the building; both floors are required to meet program accessibility; there are entrances at both the first and second levels of a two-story building.

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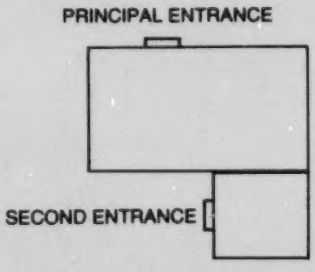
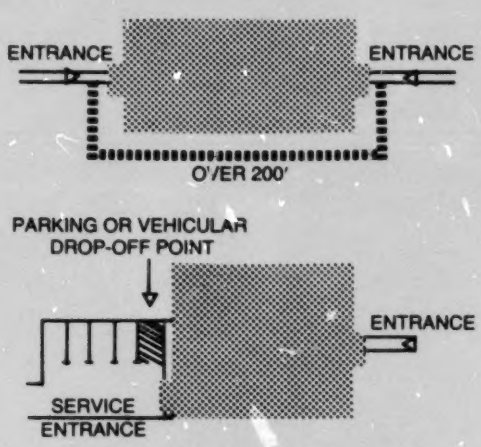
Note: *This would only be applicable if there was no need for accessible internal circulation between these floors; i.e., classroom space and library space within the same building would not necessarily have to have interior circulation between them, but a gym and a locker room in a physical education facility would require an internal means of circulation as it would not be reasonable to make a student in a wheelchair use an external circulation path in cold or rainy weather, especially if he or she is dressed in gym clothes.*

☑ There are areas in the overall building structure that are required for program accessibility, but cannot be reached internally from the accessible primary entrance; and the activities that take place in these distinct and separate spaces within the building do not require accessible interior circulation.



More than one accessible primary entrance per building should be considered but is not required if:

- The major accessible pedestrian approaches are at opposite ends of the building and the exterior circulation path is over 200 feet.
- The vehicular and pedestrian paths of travel are distinct and separate. In this case the second en-



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trance to be made accessible might be a service entrance, if this entrance provides the closest access and care is taken so that the safety of the handicapped person is ensured and the path of travel from this service entrance into the building is not through hazardous or service space, other than a service corridor.

Note: *A secondary entrance such as a side or service entrance may be renovated for use by the handicapped when a separate primary entrance is provided and the building area accessible from the secondary entrance is also accessible by the primary entrance. Entrance or path of travel for the handicapped shall not be through either hazardous or service space other than a service corridor.*

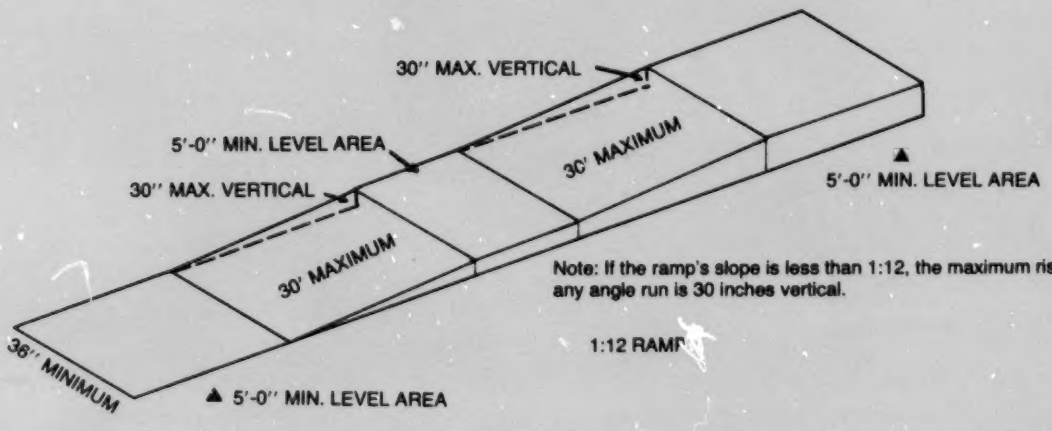
Ramp Changes of Level

When there is an abrupt change of level such as steps, a ramp can provide access to those in a wheelchair. It is very important that any time a ramp is used, it is designed properly or the ramp itself becomes a barrier. At a minimum, ramps must meet the following standards.

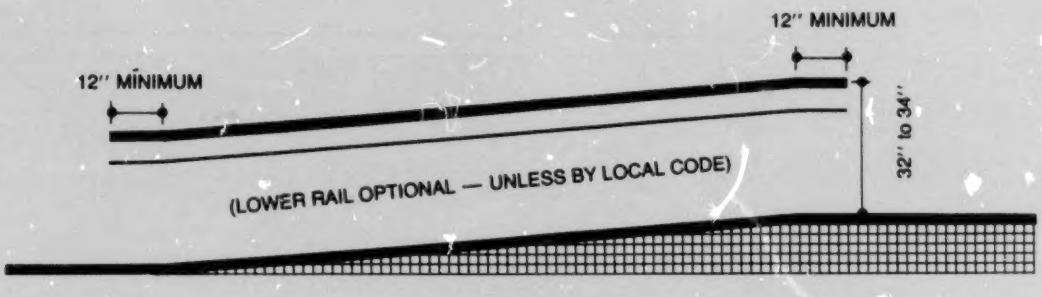
- ☑ minimum width of 36 inches
- ☑ slope not to exceed 1:12
- ☑ handrails on one side 32 inches above ramp level extending 1 foot
- ☑ surface non-slip (especially important in exterior use where there is likely to be standing water)
- ☑ where a ramp meets a door: the standards shown (ramp level platform at doorway as shown in illustration)
- ☑ level areas every 30 feet and level at the top and bottom for a distance of 5 feet
- ☑ no abrupt changes of level greater than ½ inch where the ramp meets level areas

Note: *Where there are abrupt changes of level up to 6 inches, the strict requirements for handrails are not applicable, but there should not be any abrupt drop-off on the sides of the ramp. Any change of level greater than 1 inch at a door must have a level area as shown in the illustration on page 10.*

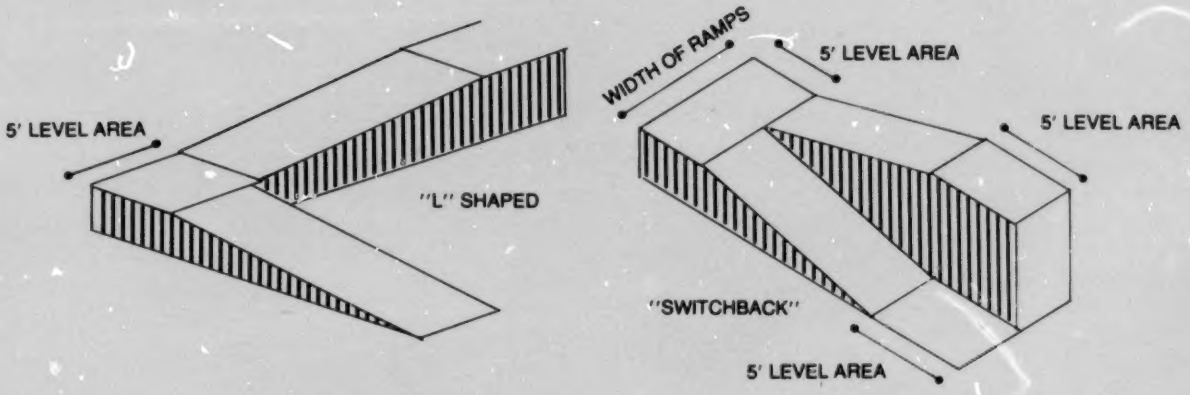
Ramp Changes of Level


30" MAX. VERTICAL
5'-0" MIN. LEVEL AREA
30" MAX. VERTICAL
30' MAXIMUM
30' MAXIMUM
5'-0" MIN. LEVEL AREA
Note: If the ramp's slope is less than 1:12, the maximum rise per any angle run is 30 inches vertical.
1:12 RAMP
36" MINIMUM
5'-0" MIN. LEVEL AREA

Examples of Accessible Ramps



9



This chapter features ramps which are required in many instances because of existing steps at the accessible entrance. In this section several accessible exterior ramps and details of these ramps are shown. Depths of footings will vary depending on the locale where the ramp is constructed.

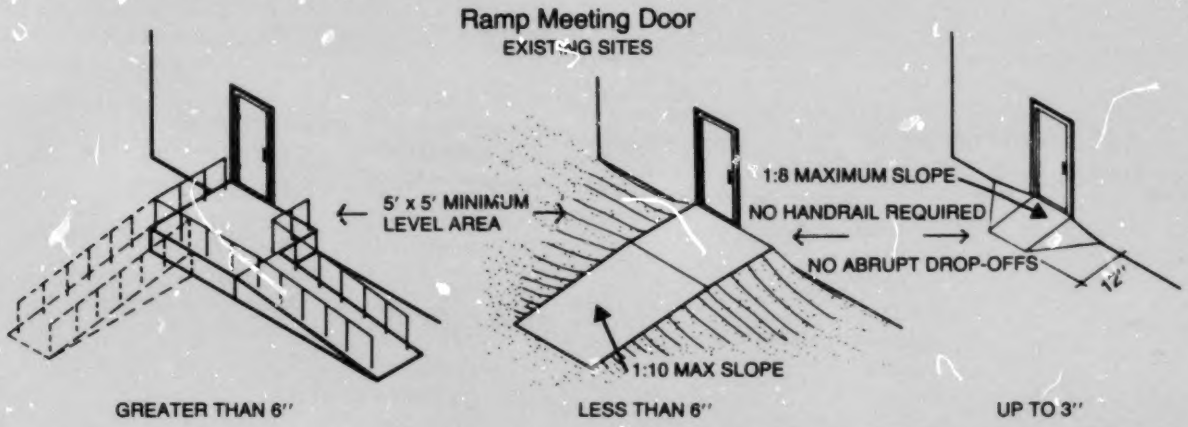
Ramp A Concept: This ramp is constructed of concrete with a metal form for the ramp slab. It should be used where severe frost action is likely to occur.

Ramp B Concept: Another less elaborate ramp can be constructed as shown on page 17. This design can be used if there is less chance for frost and if the grade can follow the ramp so that the ramp in effect becomes a sidewalk ramp. But width, rails, slope, and the level platform when approaching a door must be followed.

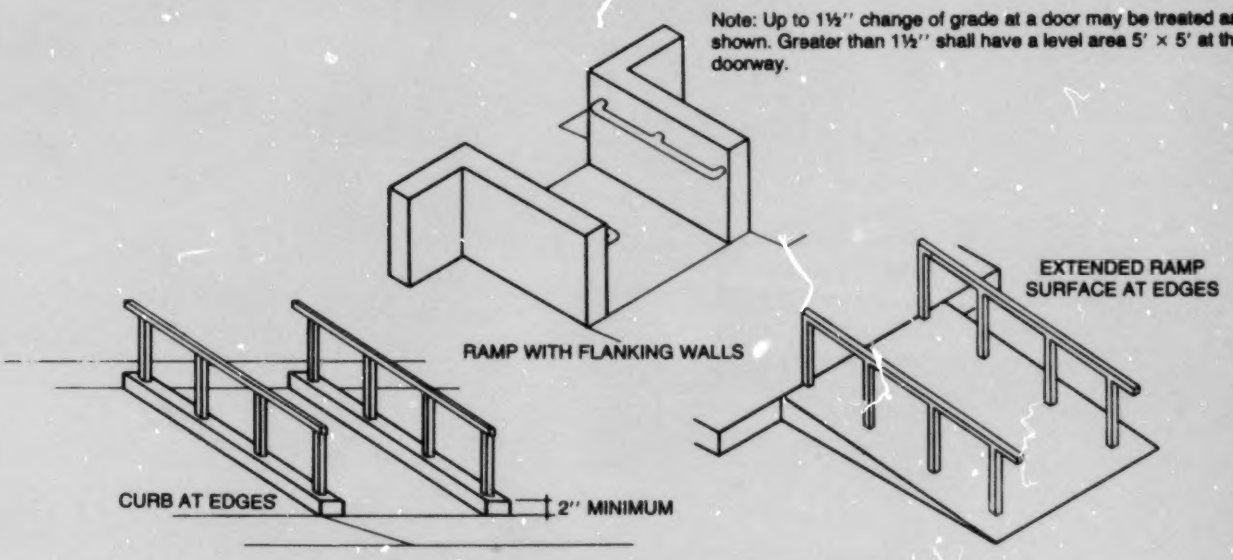
Snow and Ice Removal

There are several ways that snow and ice can be removed: electric elements, hot water, or steam pipes circulating under the slab of the ramp and its level areas. With the emphasis on energy conservation today, in some areas local laws may prohibit use of these systems. But most such systems can be automatically controlled by temperature and moisture-sensing devices so that the annual energy usage is not significant. Infrared heat lamps may also be used to prevent ice and snow buildup. In northern climates where blowing snow is a problem, temporary snow fences can help decrease the buildup.

10



Note: Up to 1½" change of grade at a door may be treated as shown. Greater than 1½" shall have a level area 5' × 5' at the doorway.



Stairs

For those disabled individuals who can use stairs, the major problem is the projecting nosing. This projecting nosing can catch the foot of a person with a leg brace and trip him or her. But, since vertical circulation using steps is impossible for those in wheelchairs, they must use elevators to reach upper levels of a building. In situations where an elevator is used to reach upper levels, it is not necessary to provide accessible stairs.

The only time stairs should be modified is when a ramp is required at the entrance being made accessible. In this situation, you are providing only two means of vertical circulation: the ramp and the stair. The ramp provides the wheelchair a means of access, but the stair, if not designed properly, can be a barrier to some people with leg braces who cannot negotiate a ramp. If there is another entrance with an existing stair that meets the stair criteria and the door requirements, it is not necessary to provide a new accessible set of steps by the ramp.

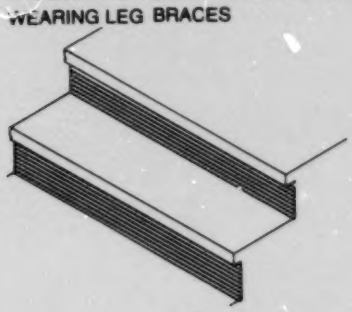
Stair standards include:

- ☑ no projecting nosing
- ☑ handrails 32 to 34 inches above the stair tread
- ☑ handrails extend at least 12 inches beyond the ends of the stairs (if they do not become a hazard themselves)

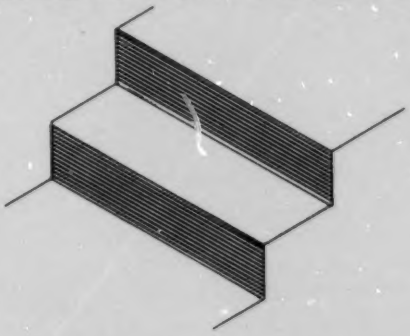
11

Making Stairs Accessible

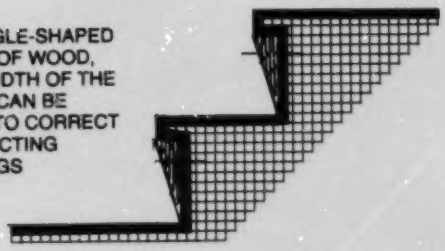
PROJECTING NOSING MAY TRIP PERSONS WEARING LEG BRACES



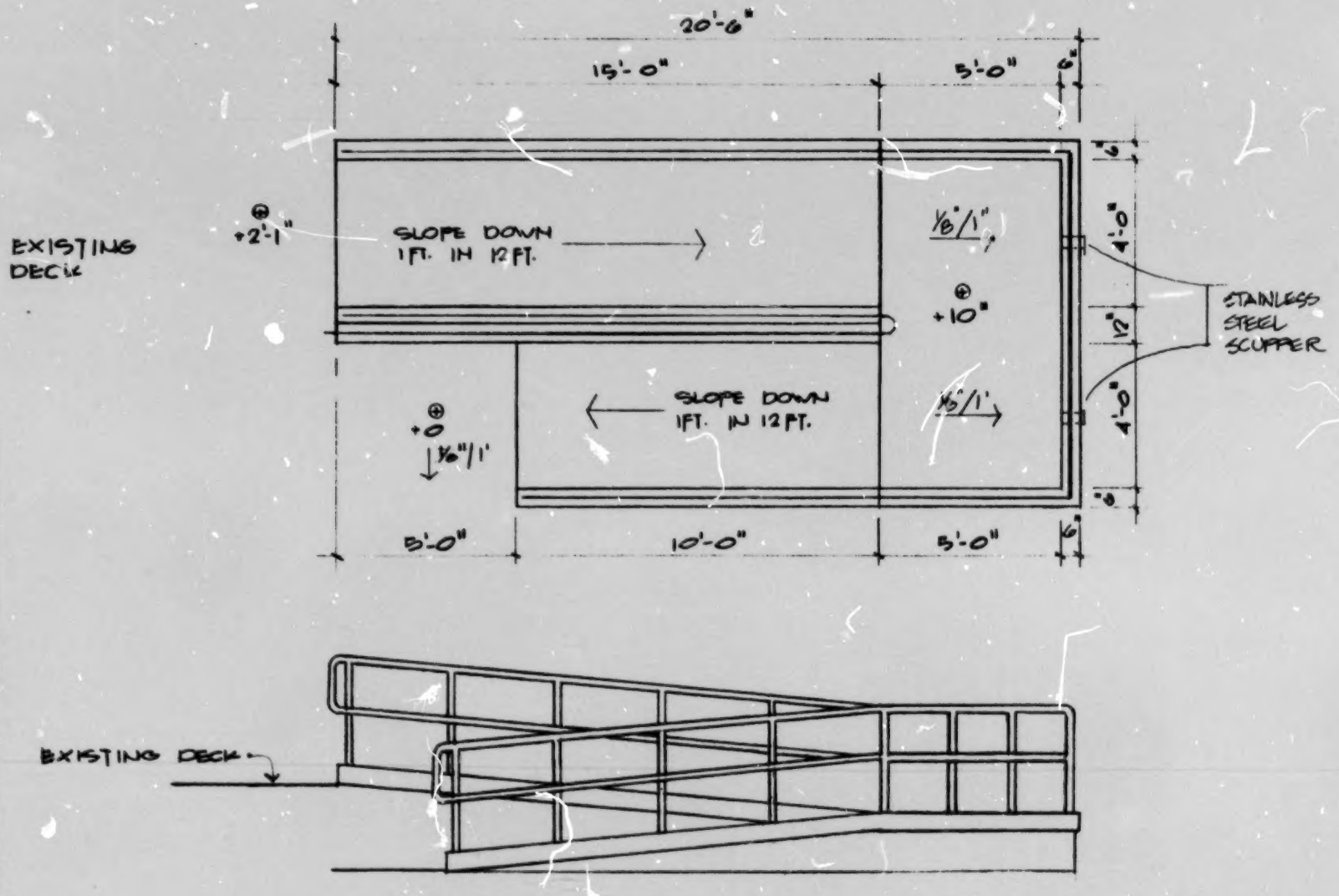
VERTICAL OR SLANTED RISER CREATES NO PROBLEM



TRIANGLE-SHAPED PIECE OF WOOD, THE WIDTH OF THE STAIR CAN BE USED TO CORRECT PROJECTING NOSINGS

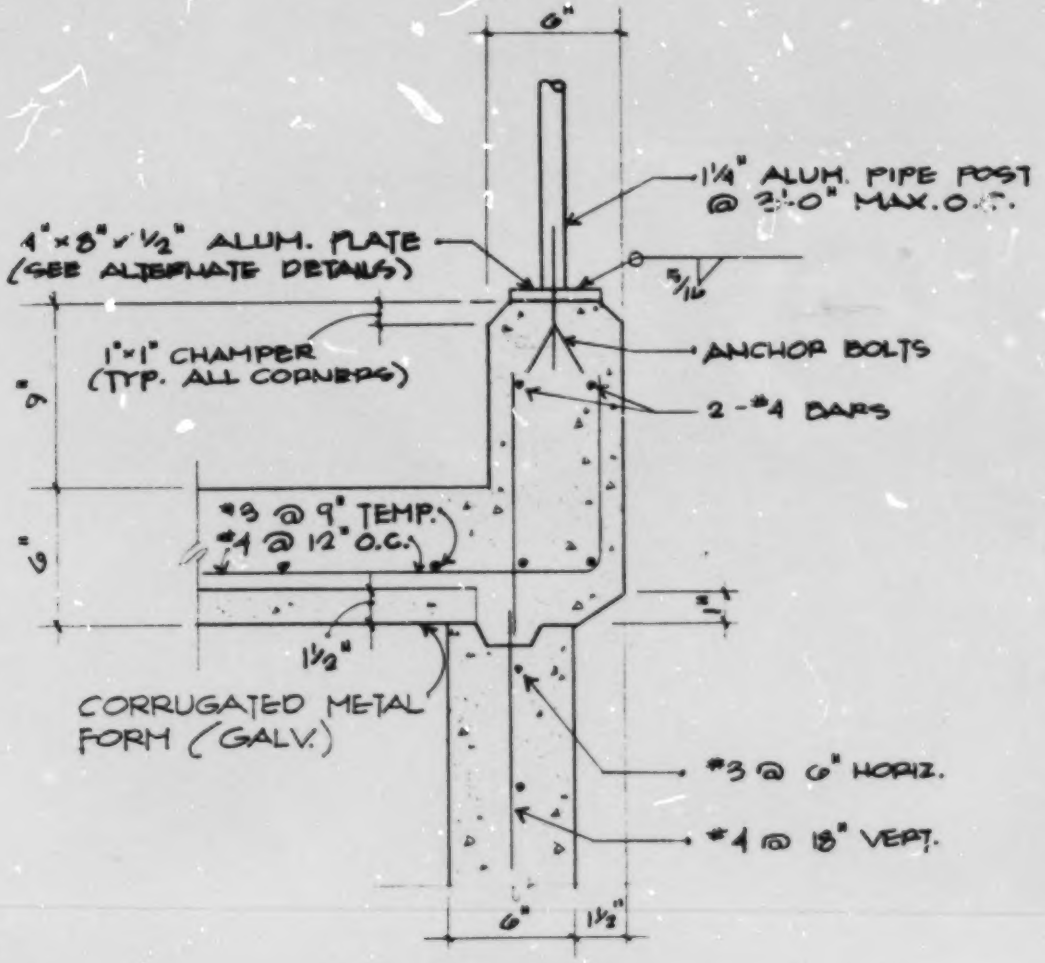


Note: When ramps and stairs appear together in the same circulation path: the stairs should be modified to be accessible.



TYPICAL SWITCH-BACK RAMP
Scale: ¼'' = 1'

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

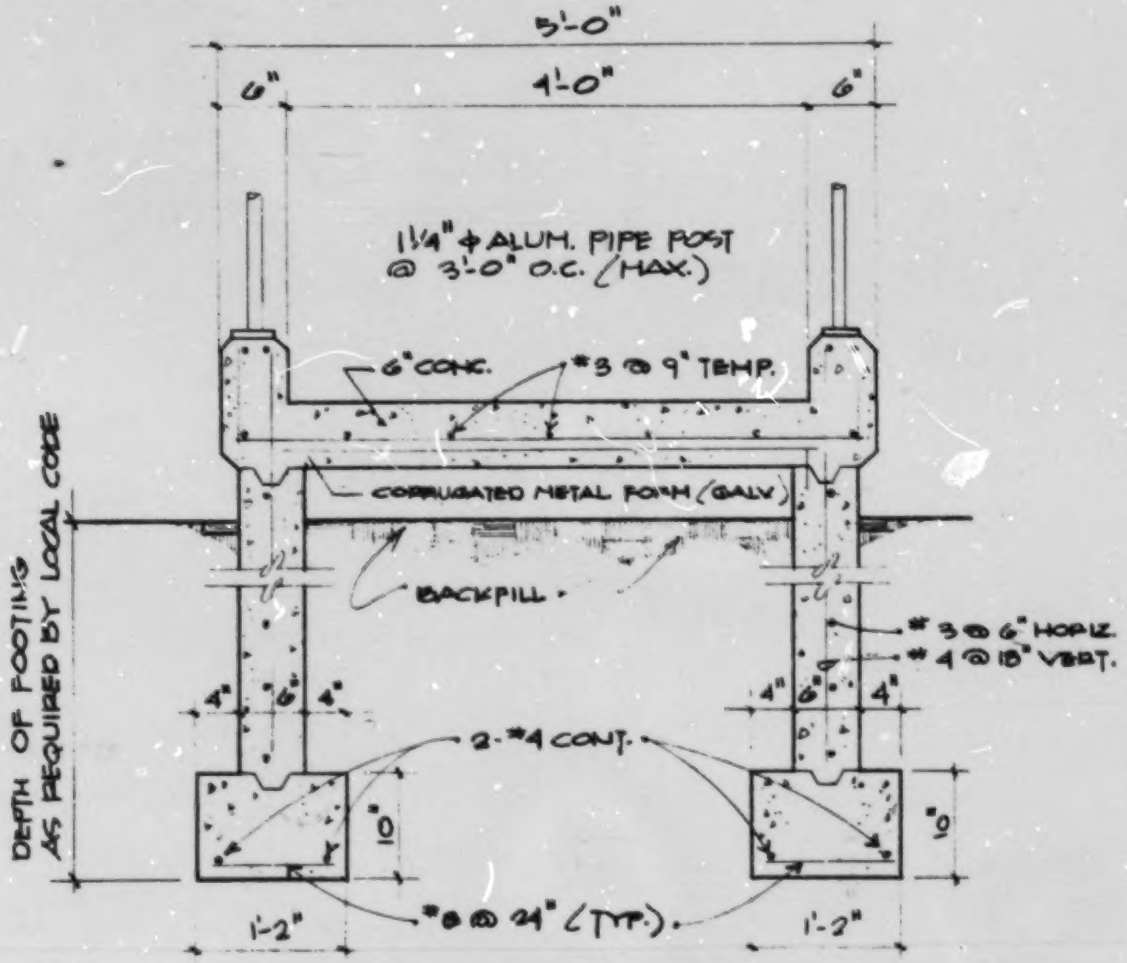


DETAIL AT SIDE WALL RAMP CURB
Scale: 1½'' = 1'-0''

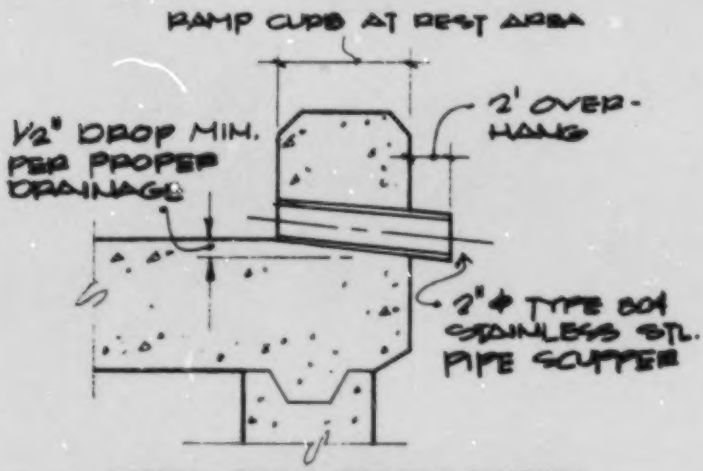
13

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

14

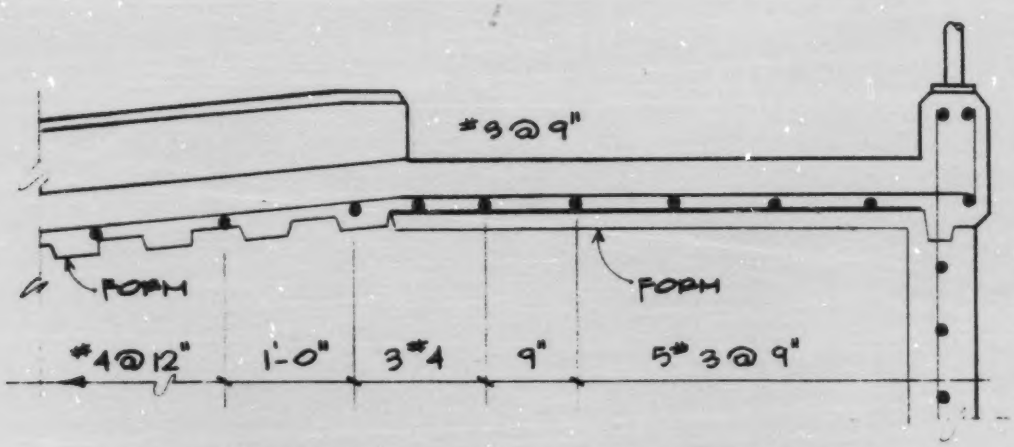


TYPICAL SECTION OF SINGLE RUN RAMP
(ELEVATION AND PLAN NOT SHOWN)
Scale: 3/4" = 1'-0"

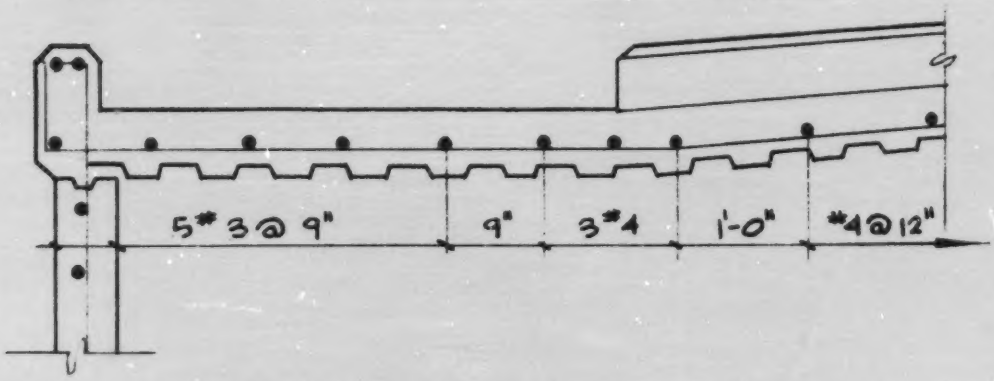


TYPICAL DETAIL OF RAMP SCUPPER
Scale: 1½" = 1'0"

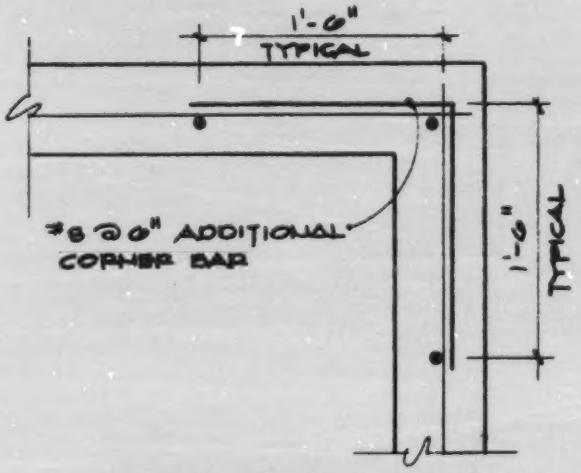
Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



TYPICAL DETAIL AT 'SIDE WALL' RAMP CORNER
Scale: ¾'' = 1'-0''

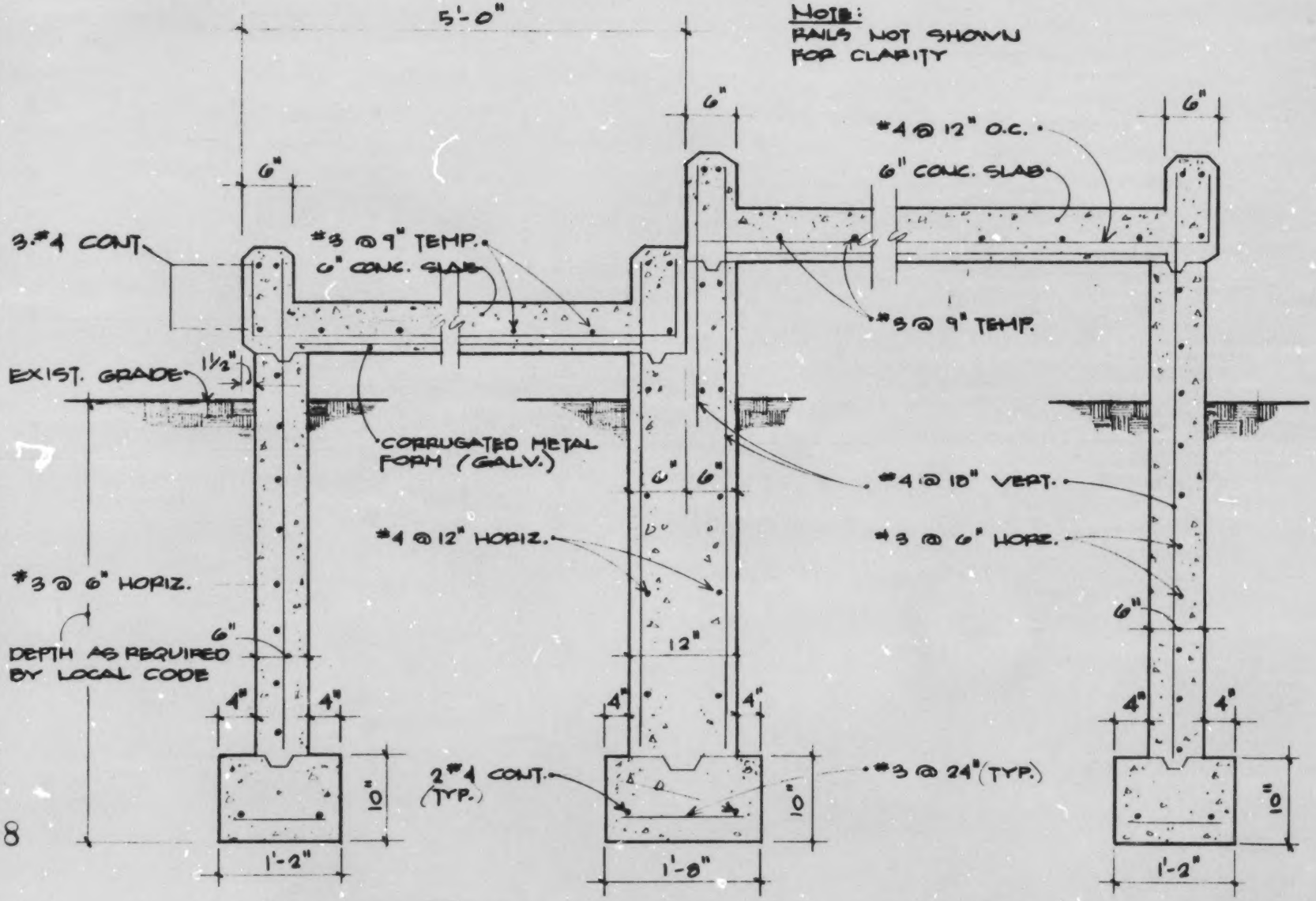


TYPICAL DETAIL AT 'SIDE WALL' RAMP CORNER
Scale: ¾'' = 1'0''



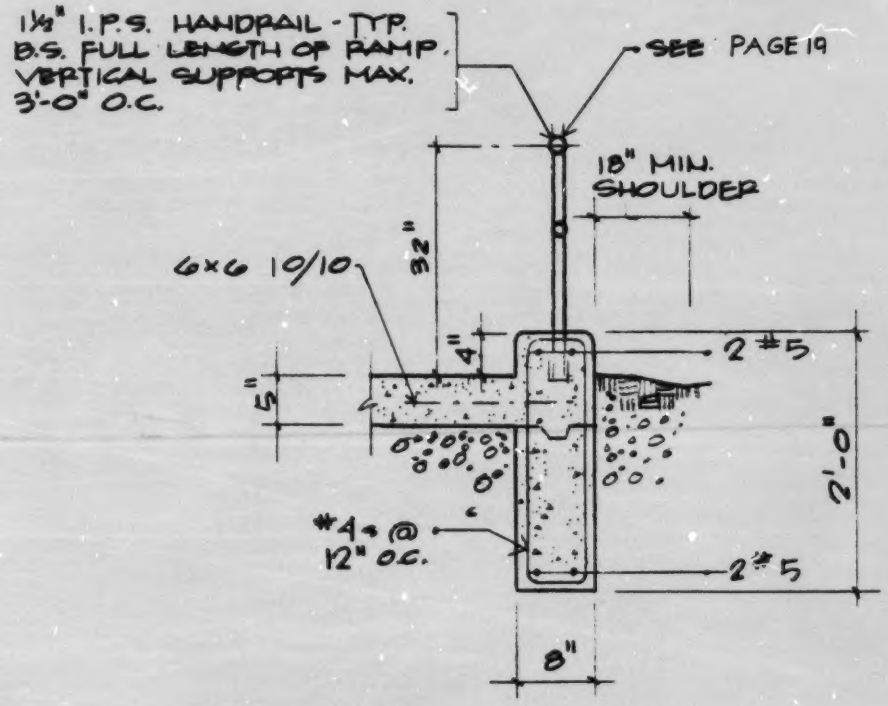
TYPICAL WALL CORNER REINF. DETAIL
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



SECTION THROUGH RAMP — TWO ADJACENT RUNS
Scale: ¾" = 1'

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

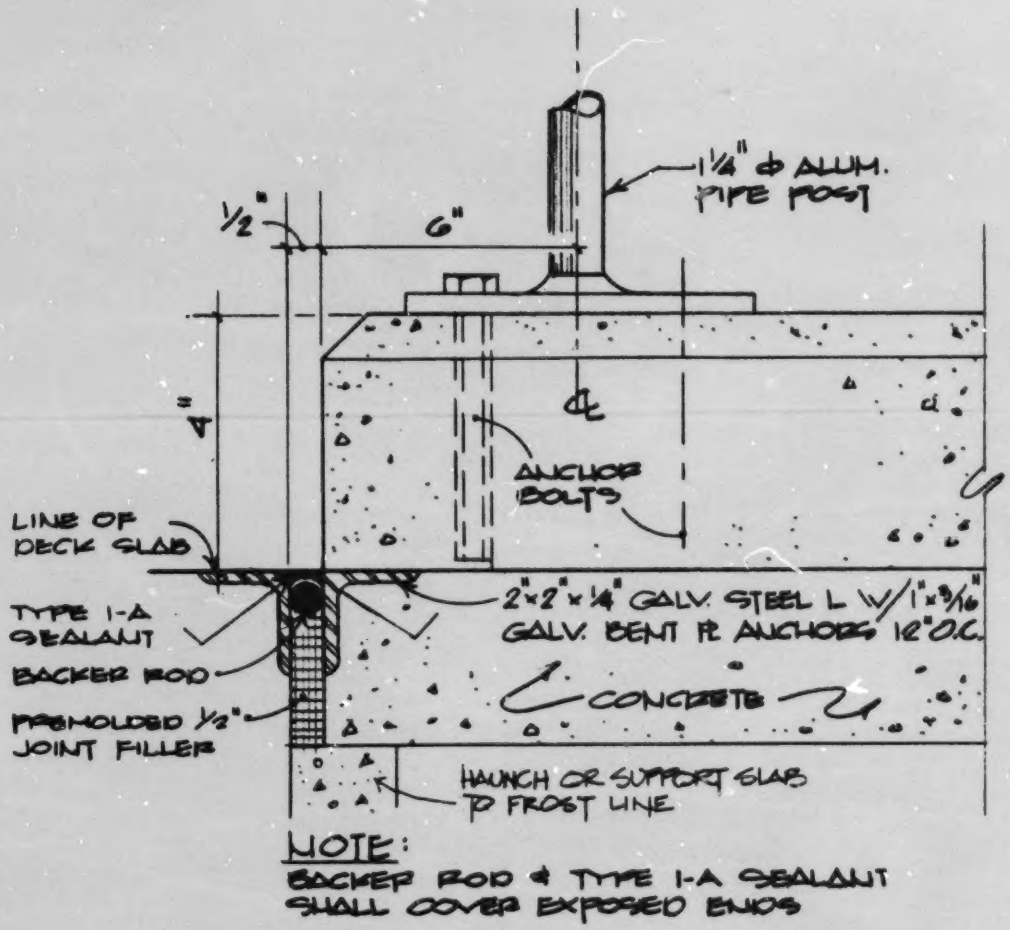


TYPICAL GRADE RAMP
Scale: ¾" = 1'

17

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

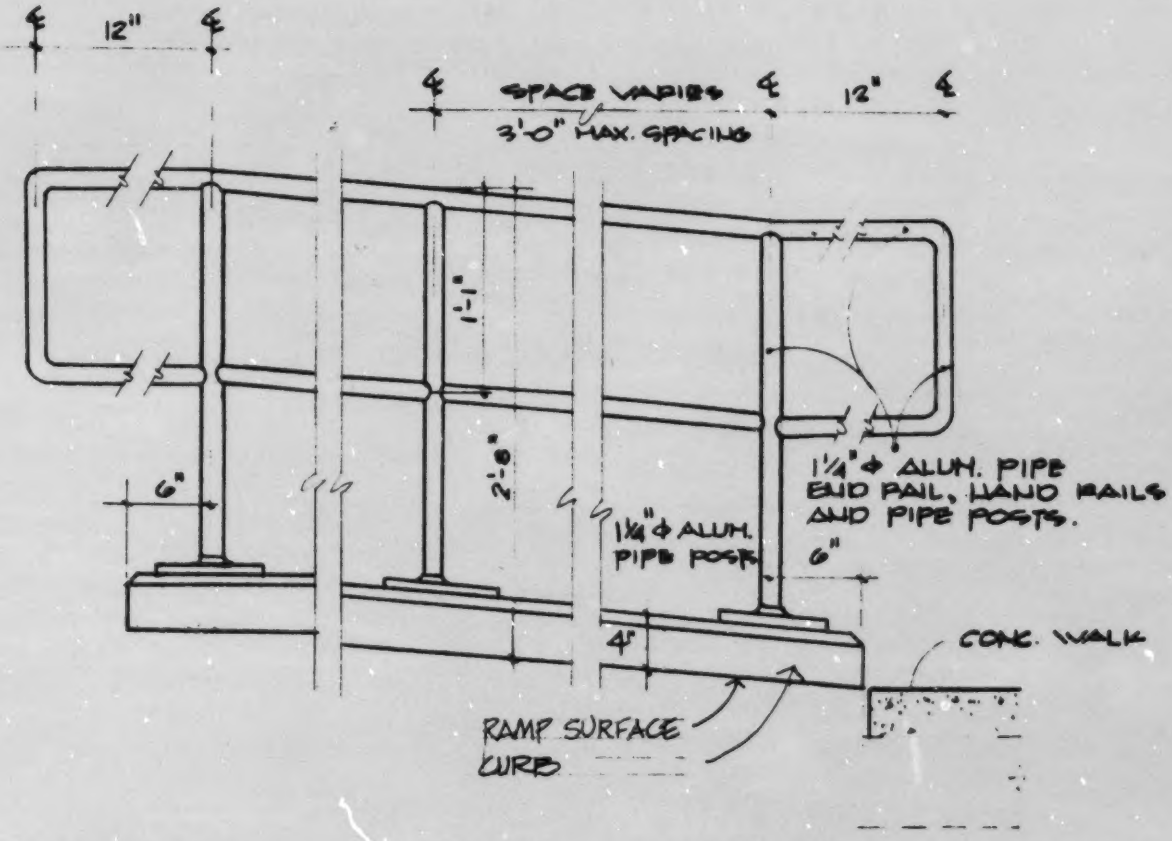
18


1¼" ϕ ALUM. PIPE POST
½"
6"
ANCHOR BOLTS
LINE OF DECK SLAB
TYPE I-A SEALANT
BACKER ROD
PREMOLDED ½" JOINT FILLER
2"×2"×¼" GALV. STEEL L W/ 1"×⅜" GALV. BENT PL ANCHORS 12" O.C.
CONCRETE
HAUNCH OR SUPPORT SLAB TO FROST LINE
NOTE:
BACKER ROD & TYPE I-A SEALANT SHALL COVER EXPOSED ENDS

SECTION WHERE RAMP ABUTS EXISTING DECK
Scale: 3" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

NOTE: THE DIAMETER OF THE GRIPPING SURFACE OF THE HANDRAIL SHALL BE BETWEEN 1¼" TO 1½" OR THE SHAPE SHALL PROVIDE AN EQUIVALENT GRIPPING SURFACE.



19

TYPICAL PARTIAL ELEVATION OF RAMP RAILINGS
Scale: 1" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Construction Specifications

The specifications below are not complete but represent the sections and items that are important to include when writing specifications for handrails.

Secure handrails to walls with wall brackets and end fittings. Provide brackets with exactly 1½ inch clearance from inside face to handrail to the finished wall surface. Drill wall plate portion of the bracket to receive one bolt, unless otherwise indicated for concealed anchorage. Locate brackets as indicated or, if not indicated, at not more than 8 feet on center. Provide flush-type wall return fittings with the same projections as specified for wall brackets. Secure wall brackets and wall return fittings to building construction.

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Chapter 3

DOORS

Doors: Exterior and Interior

All doors that are in the path of travel leading to spaces required for program accessibility must meet at a minimum the requirements listed below:

- ☑ minimum clear opening of 32 inches
- ☑ an accessible threshold that does not exceed ½ inch and is sloped
- ☑ an opening pressure that is not excessive (exterior, 8.5 lb. or less; interior, 5 lb. or less)
- ☑ usable handles or pulls
- ☑ a minimum level floor area as shown (page 22)
- ☑ if used in a vestibule, minimum space as shown (page 22)
- ☑ a texture on handle, if the door leads to a dangerous area.

Two Leaf Doors: Entrances with two door leafs are not usable by those with disabilities, unless one leaf meets the minimum 32 inch clear opening criteria. This 32 inch requirement shall be waived in existing facilities, in a lecture hall or theater, where there is no center mullion and both of the doors are held in an open position during entry and exit, or where there are electromagnetic fire door holders that keep the door in an open position.

Single Leaf Doors: Where existing single leaf doors are normally held in an open position during entering and exiting times (e.g., classrooms, laboratories, lounges, etc.), the accessible handle requirement and the space required adjacent to the handle on the pull side will be waived. All other requirements must be met.

Panic hardware is usually placed well above the area necessary for measuring the clear opening and therefore need not be taken into consideration.

Power Operators

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The 8.5 lb. of opening pressure is not always obtainable where wind and building pressure differentials are excessive. In situations like these, power-assisted or power-operated doors may be required. Also, if local fire codes require higher closing forces than 8.5 lb. and the door is required for accessibility, a power-assisted or power-operated door will be required as per the criteria below.

Power-assisted doors neutralize the closing force created by the mechanical closer. The door can be opened with minimal force. After a preset period of time, the closer returns to its normal force. If there are windy conditions most of the time, or if the door is located where the floor space adjacent to the handle on the pull side of the door is not at least 1 foot, the door should be totally power operated.

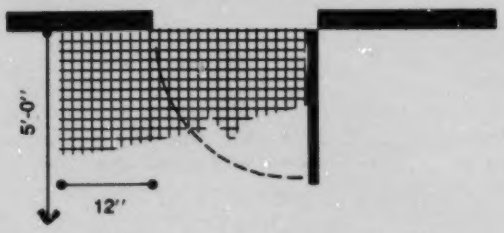
Power-operated doors provide complete automatic operation of the door, triggered either by a push button, mat, or photoelectric eye. These operators can be added on to existing side hung doors or an entire new package can be purchased. The operators should be adjustable as to "opening time" and "time in open position." They can be used on either exterior or interior doors. Power operation can also be used on sliding doors. When sliding doors are used for two-way traffic, the door does not swing into traffic in one direction; however, they are more expensive.

Modifying Exterior Doors

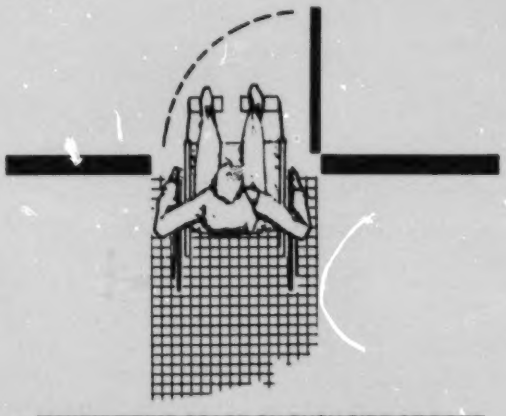
When modifying exterior doors, you should be careful that you are not violating life safety requirements by reducing the number of exit units required by local codes.

Level Areas on Both Sides of Door

MINIMUM DIMENSION OF CORRIDOR WIDTH WITH DOOR OPENING INTO CORRIDOR



MANEUVERING SPACE ON PULL SIDE OF DOOR



MANEUVERING SPACE ON PUSH SIDE OF DOOR

Note: If power operators are installed on existing doors, the requirement for the 12'' minimum space adjacent to the handle on the pull side of the door can be waived.

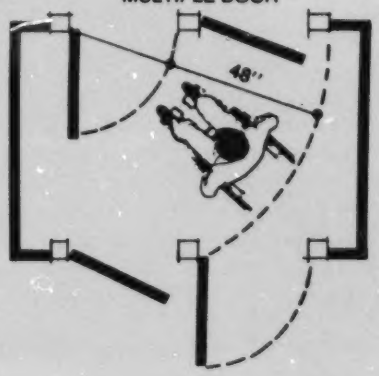
22

Accessible and Usable Vestibules

MINIMUM REQUIREMENTS FOR DOORS IN SERIES

SINGLE DOOR

MULTIPLE DOOR



Note: Doors must swing in the same direction. If doors swing away from the vestibule, the depth of vestibule can be decreased to a minimum of 4'-6''.

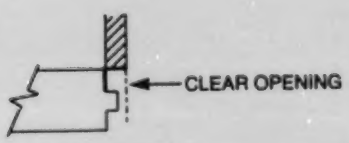
When a double-door unit is encountered (with neither door providing the necessary 32 inch clear opening), both doors can be power operated if there is no center mullion.

Clear Opening: If a 32 inch clear opening is not provided, but a clear opening is close to 32 inches (i.e., 30½ inches or greater), a "throw-out" or "off-set hinge" may be installed to provide the extra opening space to obtain the 32 inch clear opening.

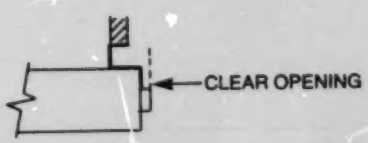
Accessible Thresholds

All doors that are required for accessibility must have a threshold that will not impede the front casters of a wheelchair from passing through the doorway. An abrupt change greater than ½ inch will prevent many people in a wheelchair from rolling over the threshold; especially if they have to hold open a door with a closer at the same time. It is important to have the threshold both ½ inch in height or less and its sides beveled or ramped.

Hinges Provide Extra Opening Space



NORMAL HINGE



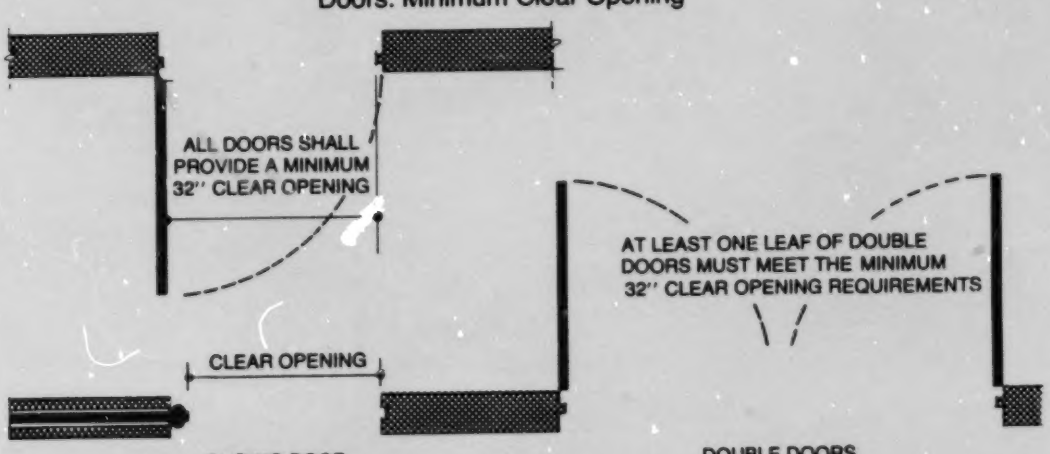
OFF-SET OR THROW-OUT HINGE

Accessible Thresholds

MAXIMUM ½" HIGH, BEVELED THRESHOLD

FLUSH WITH DOOR (NO THRESHOLD)

Doors: Minimum Clear Opening


ALL DOORS SHALL PROVIDE A MINIMUM 32" CLEAR OPENING
CLEAR OPENING
AT LEAST ONE LEAF OF DOUBLE DOORS MUST MEET THE MINIMUM 32" CLEAR OPENING REQUIREMENTS

SLIDING DOOR

DOUBLE DOORS

Door Handles

Handles, pulls, latches, locks, and other operating mechanisms on accessible doors need to have a shape that is easily grasped with one hand. It is also important that the device does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped pull handles are acceptable designs. Round knobs are not acceptable on required doors. When sliding doors are used and in their full opened position, the operating handles should be exposed and usable from both sides.

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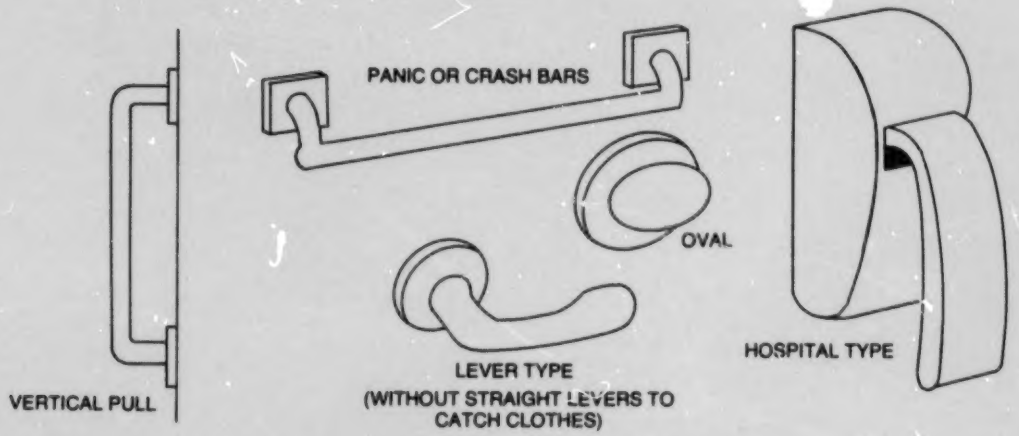
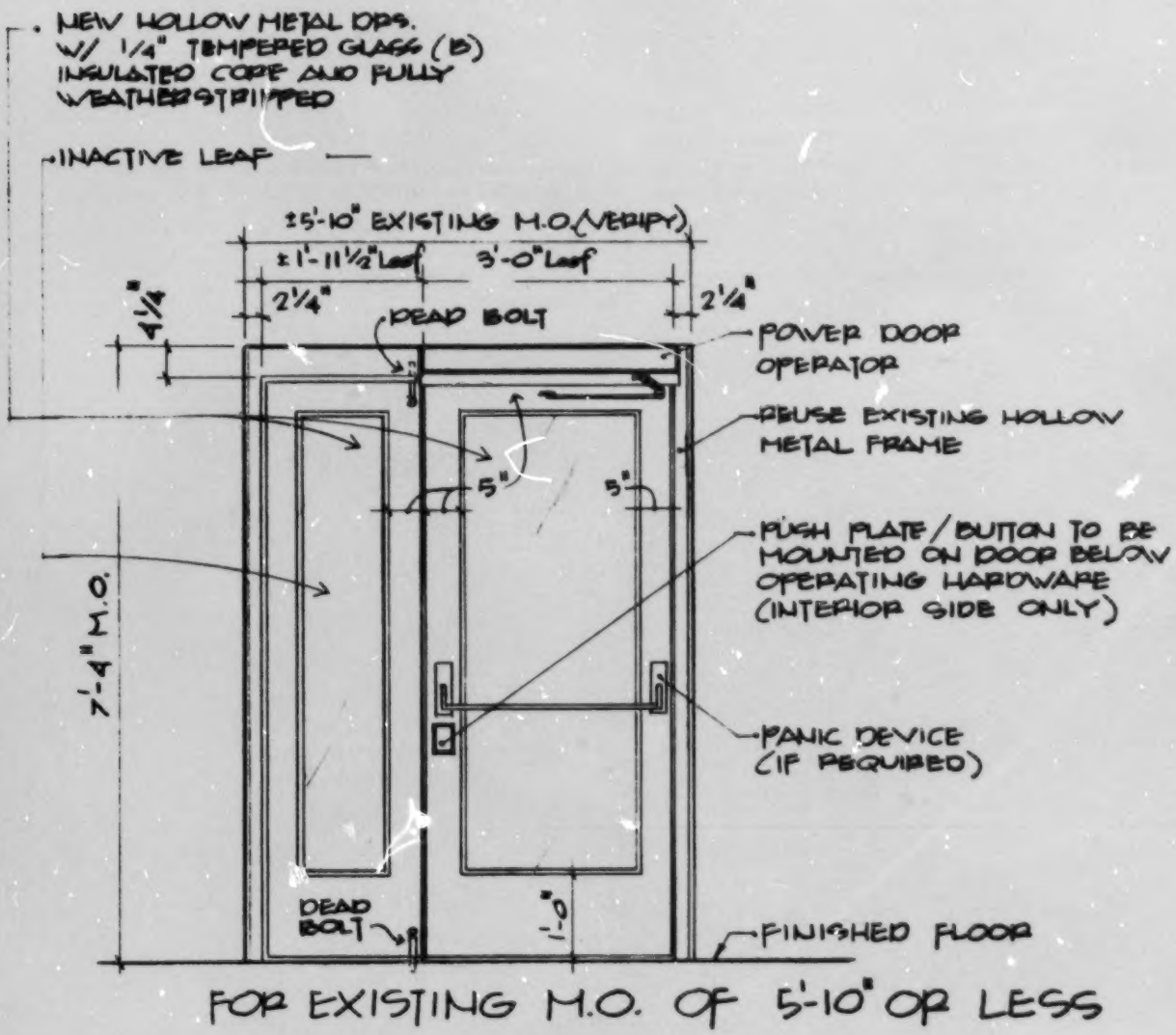
Doors Leading to Dangerous Areas

Tactile warnings shall be placed on the door handle hardware of those doors leading to an area that could prove dangerous to a blind person, (i.e., loading platforms, electric closets, boiler rooms, etc.). A textured surface can be applied to the door handle by knurling or with an epoxy grit finish. It is important to note that although a fire escape might be considered a dangerous place for a blind person, emergency exit doors or any door used for emergency egress shall not be textured, as this might deter a blind person from exiting to safety.

Accessible Door Handles





25

DOOR ELEVATION
Scale: ½'' = 1'-0''

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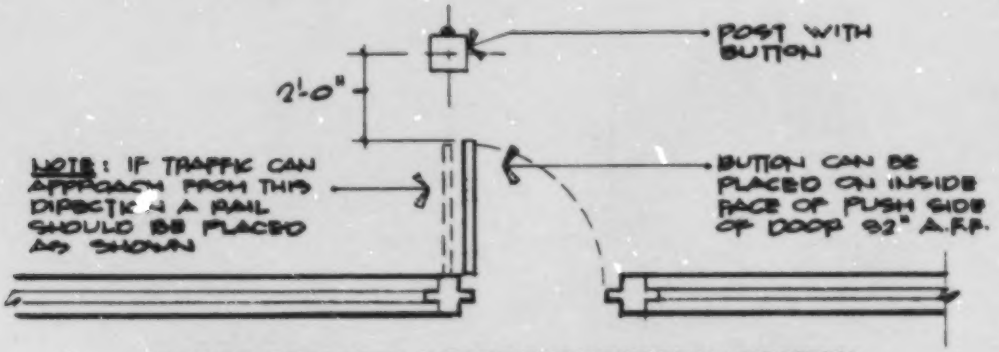
POST WITH BUTTON
2'-0"
NOTE: IF TRAFFIC CAN APPROACH FROM THIS DIRECTION A RAIL SHOULD BE PLACED AS SHOWN
BUTTON CAN BE PLACED ON INSIDE FACE OF PUSH SIDE OF DOOR 32" A.F.F.

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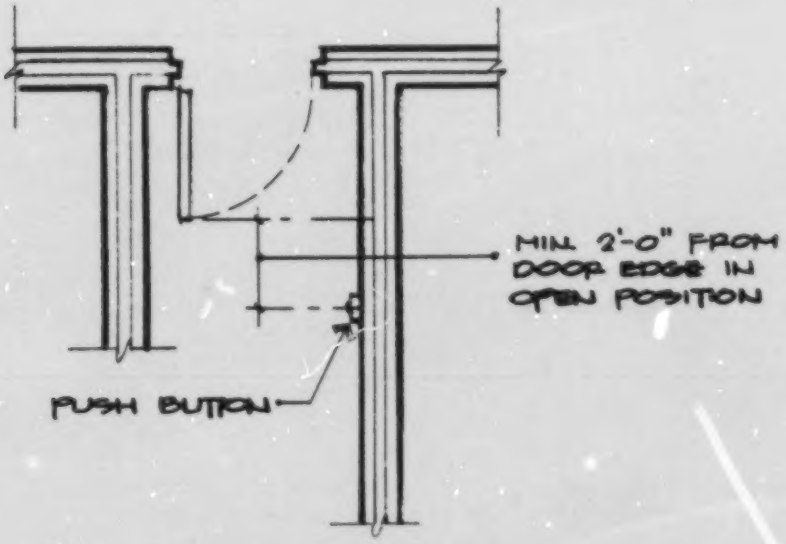
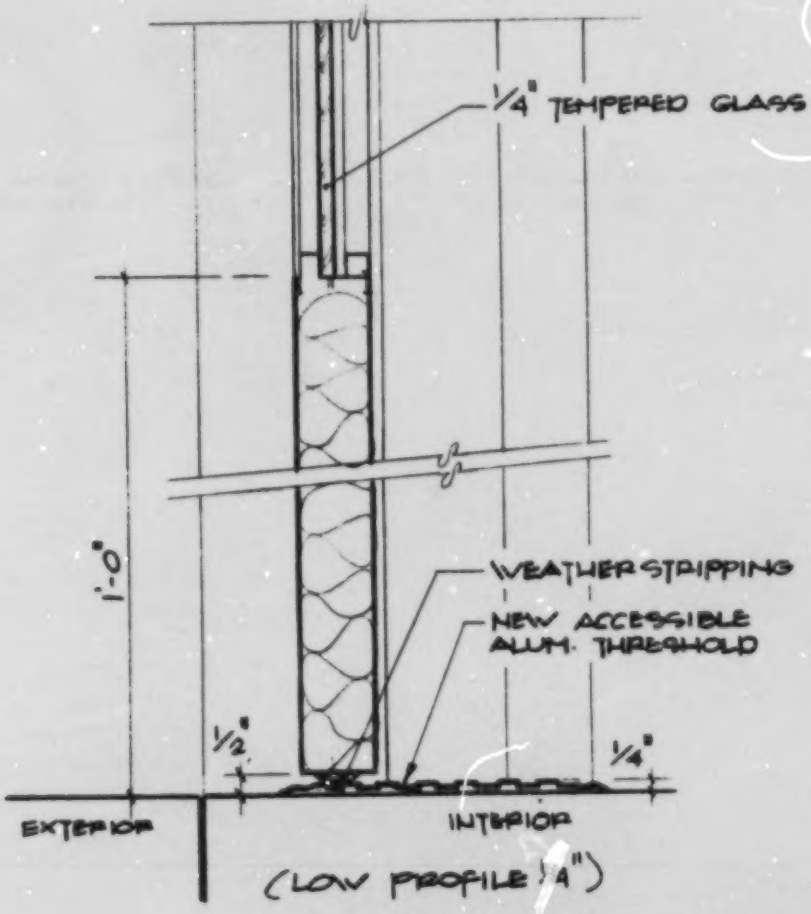
POWER OPERATED DOORS/PUSH BUTTON LOCATION
Scale: ¼" = 1'-0"



PUSH BUTTON LOCATION
Scale: ¼" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

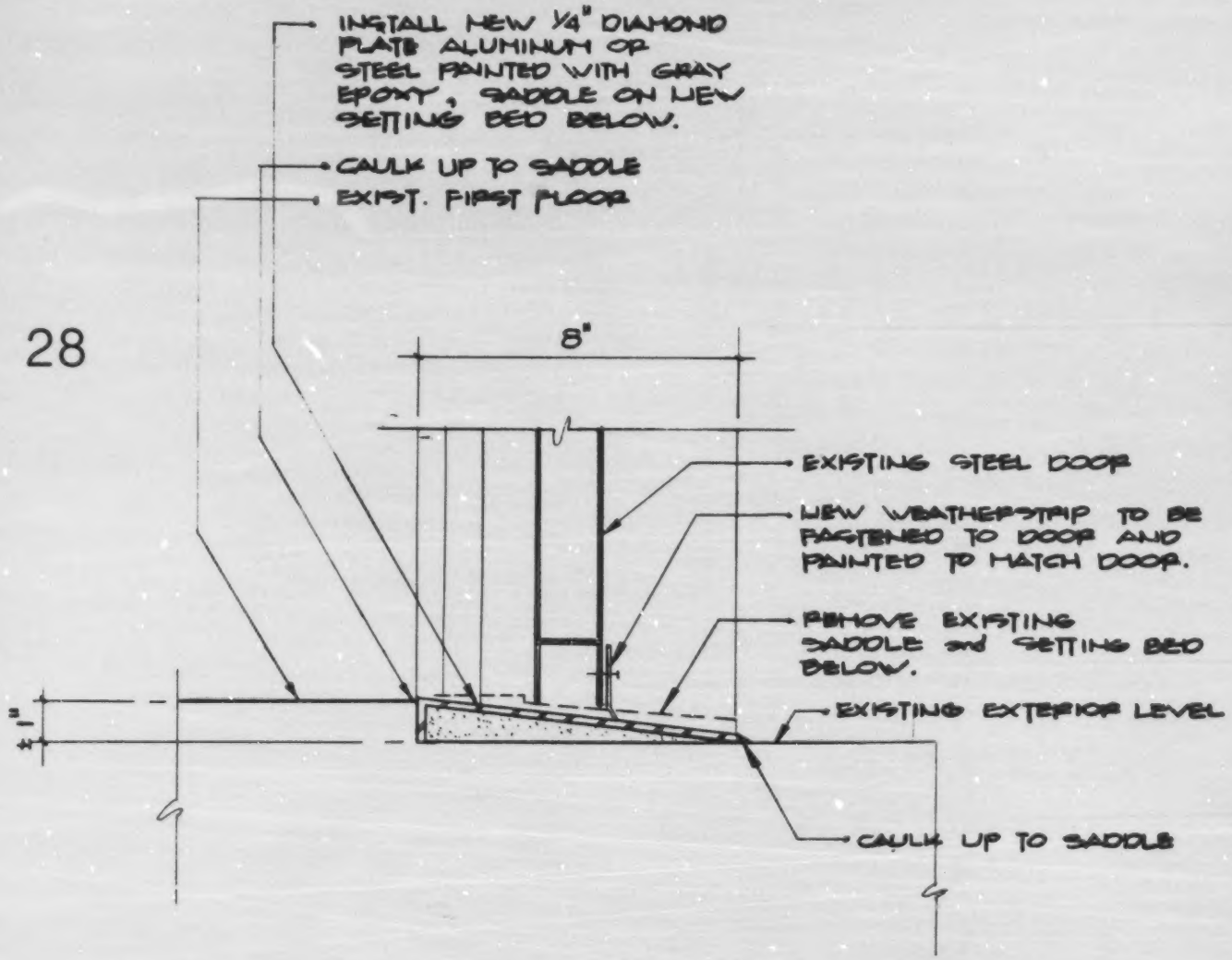


THRESHOLD DETAIL
Scale: 3" = 1'-0"

27

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

28


INSTALL NEW ¼" DIAMOND PLATE ALUMINUM OR STEEL PAINTED WITH GRAY EPOXY, SADDLE ON NEW SETTING BED BELOW.
CAULK UP TO SADDLE
EXIST. FIRST FLOOR
8"
EXISTING STEEL DOOR
NEW WEATHERSTRIP TO BE FASTENED TO DOOR AND PAINTED TO MATCH DOOR.
REMOVE EXISTING SADDLE and SETTING BED BELOW.
EXISTING EXTERIOR LEVEL
CAULK UP TO SADDLE

DOOR SADDLE DETAIL
Scale: 3'' = 1'-0''

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Construction Specifications

Please note that the following specifications are not inclusive but represent items that should be included where applicable when writing specifications for accessible doors.

Fire-Rated and Emergency Exit Openings: Provide door units that comply with the requirements for doors as emergency exits and do not interfere with fire ratings (if any), as certified by the manufacturer for the application shown.

Manual Door Closers: Spring power of each closer must be adjustable, Size II through Size VI. Regulating screws shall be tamperproof and adjustable only with hex wrench. Closers shall have separate adjustments for latch speed, general speed, and back-check. They shall have a back-check porting adapter valve to set cushioning of opening swing in advance of 90° for any standard mounting. All closers and accessories, except special purpose types, whether applied hinge side, stop face, over door, or on bracket, shall be non-handed. Hydraulic fluid shall be of a type requiring no seasonal adjustment for temperatures ranging to −30° F (−35° C). All closer cylinders, being non-sided, non-handed, and with the potential for application in all standard mountings, shall be interchangeable. All closers shall be from one manufacturer and carry a five (5) year warranty.

Power Operators

Function: Automatic door operators shall be self-contained electric and/or hydraulic "slow-mode" operators designed for use by the handicapped without need for safety mats or rails.

Doors shall open automatically by power and close by spring or electric power. Operators shall also function as ordinary door closers at any time; during any mode of power operation, or when not under power.

Automatic opening speed shall be adjustable to open the door at a uniform speed from closed to 90° open in 3 to 9 seconds. Adjustment time to be recommended by institution.

Doors shall be held open for an adjustable period of time from 0 to 30 seconds. Adjustment time to be recommended by institution.

Doors shall close by spring power with separate hydraulic controls for closing and latching speeds. Closing speed shall be adjustable to close the door from 90° open to the latch position in 1½ to 5 seconds. Latching speed shall be 1½ seconds to gently close the door against its stop, and sufficient power to latch or hold the door in a closed position.

Operation shall be by remote push plate switches. Depressing the switch plate shall activate the open/close cycle. Depressing the switch while the door is in the hold open position or is closing will restart open/close cycle to cause the door to remain open for the full hold open period.

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Resistance exceeding 15 pounds at the latch side of the door shall cause the operator to immediately reverse its cycle.

Door Operator Installation: Disengage existing door operating mechanism, springs, and back-check unit. Replace arms and pivots if necessary.

Disengage existing floor closers and checks and/or replace with new pivots as necessary.

Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather, and anticipated frequency of use.

Electric Door Operators, Sliding: Manufacturer's standard electric drive unit, self-contained with connections for power and control wiring, power opening and either power or spring closing with safety release clutch for obstructed closing, and with checking for both opening and closing cycles. The operator(s) shall allow the door(s) to be operated manually in power on or power off conditions.

Breakaway Device: All sliding door leafs shall be equipped with a panic breakaway device concealed within the top of the door. The sliding door leaf(s) and the swing away side light(s) shall have a concealed shock absorber control arm

mounted in the top rail to control the swing arc when door(s) or side light(s) is in panic mode.

Door Operator Controls and Accessories

Push Plate: Provide press type wall plate switches (two per door) with adjustable time delay (hold open).

Electrical Interlocks: Wherever feasible, provide electrical interlocks that will prevent operation of unit when operation of door is prevented by lock and latch or door bolts. If this is not feasible, provide key switching at door location to shut off power when the building is locked.

Electric Strike: Provide an electric strike to permit opening and closing a door automatically that is secured with a latch or bolt, with separate solid-state interface control. *This specification should be used if door is to be automated.*

Thresholds

Size/Profile: As indicated or, if not indicated, manufacturer's standard for condition of exposure.

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Chapter 4

INTERIOR CIRCULATION

Interior Doors

Interior doors in the path of accessible travel are required to meet the requirements (p. 21).

Horizontal Circulation and Spaces Needed for Program Accessibility

It is necessary to provide an accessible path of travel inside the building to any and all spaces required to meet program accessibility. This does not mean that every space in the building has to be accessible. Once the building entrance has been established, you should ascertain which floors of the building have to be accessible, and then determine if these floors can be reached by a mobility-disabled person.

Within those areas required for program accessibility, floors, hallways, and passageways should be barrier-free without abrupt changes of level. Rooms and spaces needed for program accessibility should not be at a different level from hallways unless they are properly ramped or chairlifts are provided.

Floors above and below the entrance level must be connected by ramps or elevators to be considered accessible. If these floors are already connected by ramps or elevators, the elevators and ramps have to meet the minimum requirements listed under the appropriate criteria section.

If there are two levels in a building and two different functions take place at each level, and each level has its own accessible entrance, then it is not necessary to have accessible interior vertical circulation. For example, an administration/classroom building does not need interconnecting interior circulation if both floors are accessible by external entrances, but a physical education building with locker rooms on one floor and gym facilities on the other would need internal vertical connections that are accessible.

Stairs

All stairs, except those in an enclosed stair tower, should have a tactile warning at the top of the stair run. The tactile warning can be a change of texture in contrast with that of the path of travel leading to the stair. If this path is carpeted, for example, you should change the texture by removing an area of carpet a distance of three feet from the top step and replacing it with tile or some other hard surface. A color change as well as a texture change will make the tactile warning more apparent to the partially blind.

Edges of Dangerous Low Areas

The edge of areas such as reflecting pools should also have a tactile clue or warning to prevent a blind person from stumbling into the pool. This tactile clue could be a curb, a rail, or a texture change.

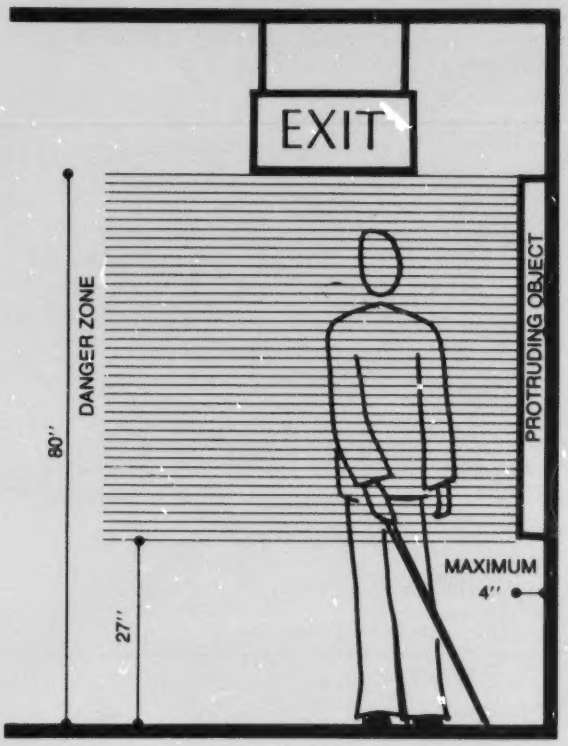
Protruding Objects in Path of Travel

There is a danger zone for blind people using the long cane technique. This danger zone is caused by wall-mounted objects that project into the path of travel. An object such as a telephone booth or drinking fountain cannot be detected by the long cane if the protruding areas of the object fall entirely within an area 27 to 80 inches above the floor. The object then becomes a hazard to a blind person. If a wall-mounted object does fall within this danger zone, it can protrude only four inches from the wall surface. All hallways, corridors, and aisles should be examined for objects that fall into this category.

If an object extends to below 27 inches from the floor, the long cane technique will detect it. Objects projecting into this lower area can protrude any distance from the wall without becoming a hazard to the blind.

Objects such as signs shall not extend down from the ceiling into the upper range (below 80 inches from the floor) of this danger zone.

Removing Protruding Objects in Hallways



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Vertical Circulation—the Elevator

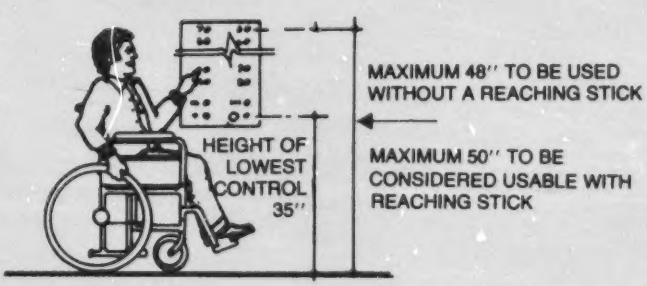
In many instances, elevators are required for vertical circulation. For new construction or installation of a new elevator in an existing facility, there are other standards that should be applied, but for either of the above instances, we are concerned only that the existing elevator meet minimum requirements required to provide safe and accessible transport.

- ☑ size (as shown on page 33)
- ☑ door shall provide a 32 inch minimum clear opening
- ☑ accessible to entrance of building
- ☑ space in front of elevator at least 5 feet wide by 4 feet deep
- ☑ elevator must level within ± ½ inch
- ☑ height of controls should not exceed 48 inches with the emergency stop control at bottom. Where elevator buttons can be operated with a reaching stick (provided by the institution), 48 inch height requirement extended to 60 inches
- ☑ door must have either a safety shoe, photo-eye or other means to stop it from closing on persons entering or exiting. *Side hinged rather than automatic sliding doors must meet all criteria for doors, If there is a retractive gate, it cannot require more than 5 lb. opening pressure. If these criteria cannot be met, the institution has the option of providing attendant operation or installing a new elevator car.*

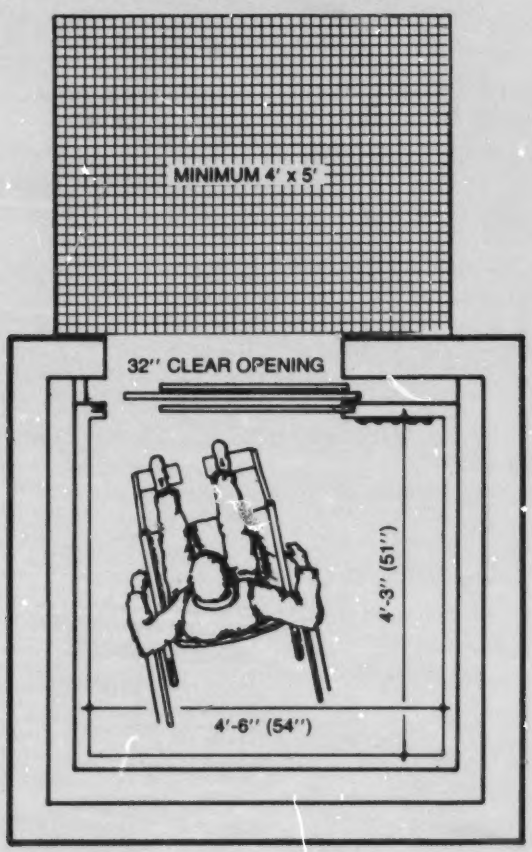
As a general rule of thumb, a 1500 lb. elevator will provide minimum accessibility for an existing facility.

Often it seems as if a new elevator will be required for a building you are investigating. In many cases, programs have been transferred to other buildings or to the first floor of the facility so that this new elevator is not needed. In other instances, it would be unrealistic to move the programs—i.e., specialized laboratories on the second and third floors of a building would be expensive, if not impossible, to move.

Accessible Elevator Controls


MAXIMUM 48" TO BE USED WITHOUT A REACHING STICK
HEIGHT OF LOWEST CONTROL 35"
MAXIMUM 50" TO BE CONSIDERED USABLE WITH REACHING STICK

Minimum Elevator Criteria



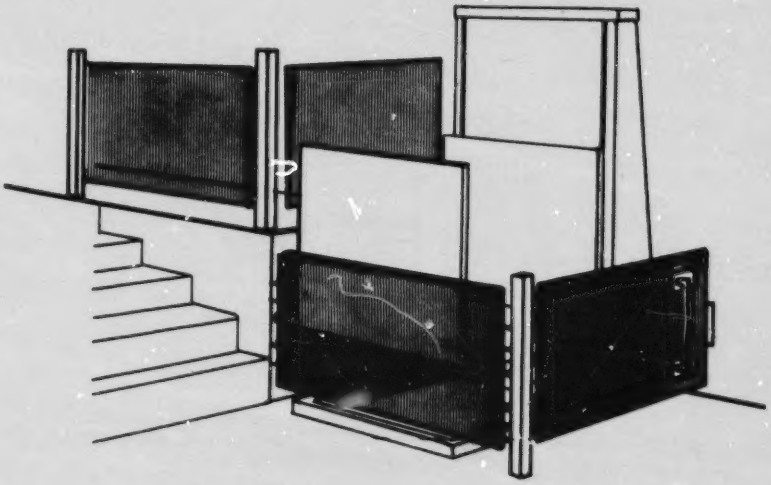
Note: The 4'-3" x 4'-6" (1500 lb elevator) and 4'-3" x 5'-8" (2000 lb elevator) will not allow a wheelchair to turn around, but will be acceptable as a means to comply with 504 in existing structures.
If a 36" clear opening door is provided in an existing elevator, the depth of the elevator can be reduced to as little as 46" if the width of this existing elevator exceeds 5'-0".

Wheelchair Lifts

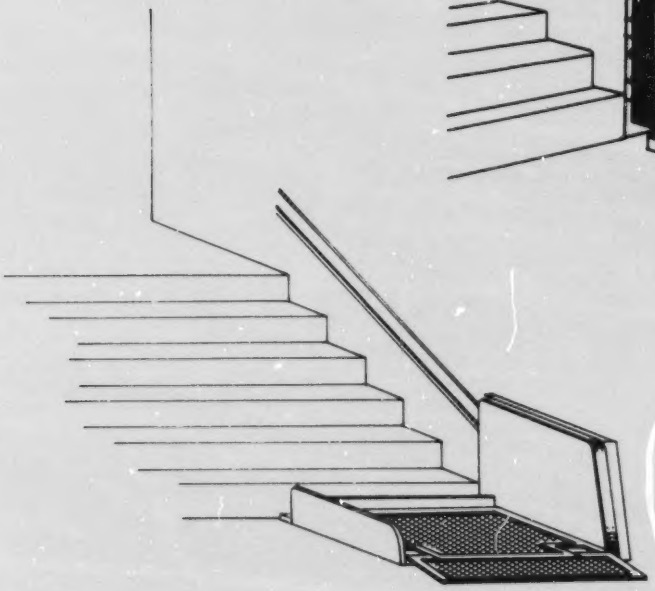
Wheelchair lifts can be used (local or state codes permitting) when there is not enough space for a properly designed ramp. It is essential that the lift be safe and reliable. There are two types currently available:

A lift that operates like an elevator (vertically). As many of these "lift-packages" come without safety features, you should verify that the following are included: safety gates that prevent anyone from entering the lift platform unless it is at the same level as the gate; cut-off controls to stop the lift if it contacts an obstruction while lowering, and a manual mechanical override so that a person using a wheelchair can be rescued if there is a power or equipment failure.

A lift that travels up a flight of stairs. The most important consideration relating to this type of lift is that the stairway is wide enough to accommodate both the lift and able-bodied use if the stair is needed for fire exiting. The decreased width size of the stair should comply with applicable local codes. This type of lift should also meet the requirements of the vertical lift. *If the lift is to be used independently by the disabled, it shall be able to be summoned from either station without the platform being folded in an upright position.*



VERTICAL WHEELCHAIR LIFT



INCLINED STAIRWAY WHEELCHAIR LIFT

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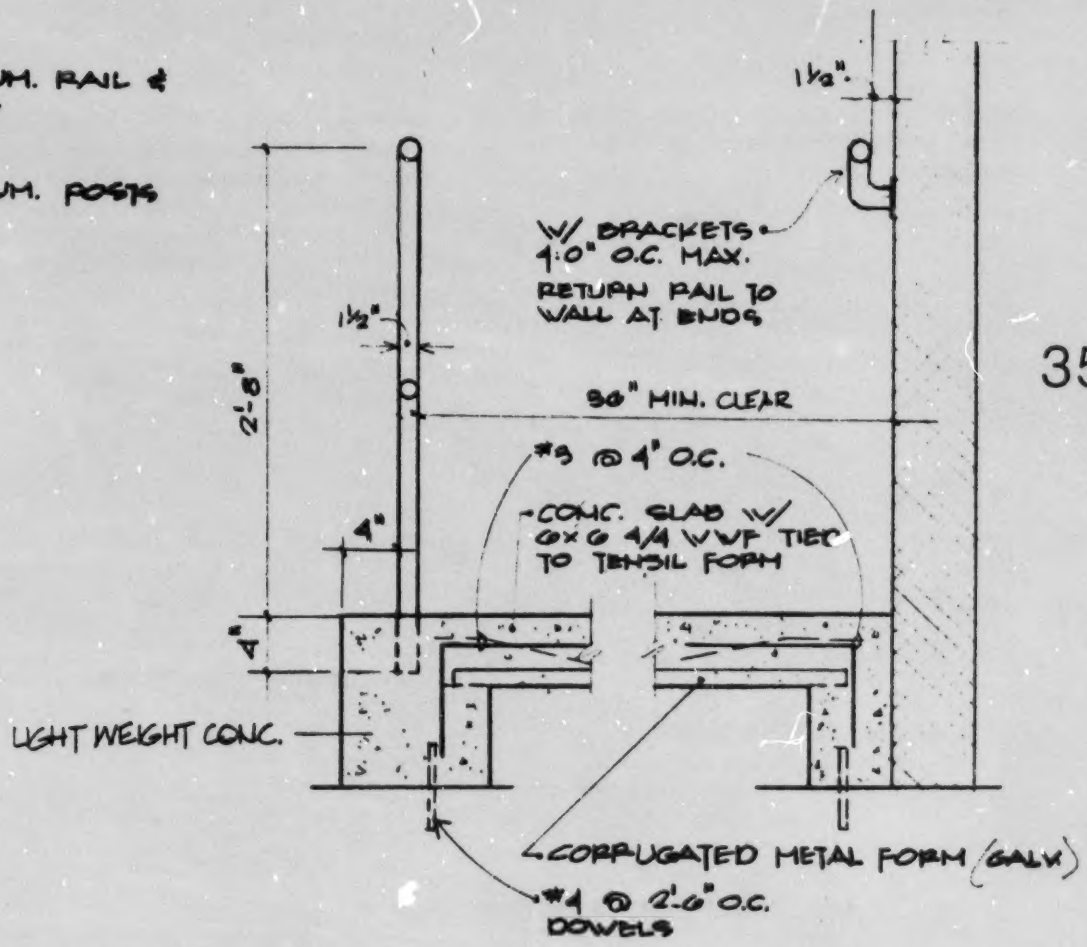

INTERIOR RAMP SECTION
Scale: 1" = 1'-0"

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Construction Specifications

These specifications are not all inclusive but represent those areas that should be included for barrier-free access.

Elevators

Door Protective and Reopening Device: Elevator doors shall open and close automatically. They shall be provided with a reopening device that will stop and reopen a car door and hoistway door automatically if the door becomes obstructed by an object or a person. The device shall be capable of completing these operations without requiring contact for an obstruction passing through the opening, at heights of 5 inches and 29 inches (125 mm and 735 mm) from the floor. Door reopening devices shall remain effective for at least 20 seconds. After such an interval, doors may close in accordance with the requirements of the *American National Standard Safety Code for Elevators Dumbwaiters Escalators and Moving Walks* A17.1-1978.

Height: All floor buttons shall be no higher than 54 inches (1,370 mm) above the floor. Emergency controls, including the emergency alarm and emergency stop, shall be grouped at the bottom of the panel and shall have their centerlines no less than 35 inches (890 mm) above the floor.

Locations: Controls shall be located on a front wall if cars have center opening doors, and at the side wall or at the front wall next to the door if cars have side opening doors.

Door and Signal Timing for Hall Calls: The minimum acceptable time from notification that a car is answering a call until the doors of that car start to close shall be calculated from the following equation:

$$T = \frac{D}{1.5 \text{ ft/s}} \quad \text{or} \quad T = \frac{D}{455 \text{ mm/s}} \qquad \text{(Eq 1)}$$

where
T = total time in seconds
D = distance (in feet or millimeters) from a point in the center of the lobby or corridor 60 inches (1,525 mm) directly in front of the farthest call button to the centerline of the hoistway door. For cars with in-car lanterns, "T" begins when the lantern is visible from the vicinity of hall call buttons and an audible signal is sounded. The minimum time for elevator doors to remain fully open shall be 3 seconds.

Inside of Car: The inside of the car shall allow for turning of the wheelchair. The minimum clear distance between the walls or between wall and door excluding return panels shall not be less than 68 inches (5 feet, 8 inches) x 54 inches (4 feet, 6 inches). Minimum distance from wall to the return panel shall not be less than 51 inches (4 feet, 3 inches).

Hall Call Buttons: The centerline of the hall call buttons shall be centered 44 inches above the floor. The button designating "up" shall be located on the top.

Direction buttons, exclusive of border, shall be a minimum of ¾ inch in size, raised, flush, or recessed. If recessed, the button shall not be recessed more than ⅜ inch. A visual indication shall be provided to show each call registered and shall be extinguished when the call is answered.

Hall Lantern: At each hoistway entrance a visual and audible signal shall be provided to indicate which car is answering the call and its direction of travel.

Note: *Some systems are set up so that the car will not stop at the call floor unless it has no other preinstructed travel orders. In this case, no direction light will be necessary but an audible signal should be provided. The visual signal for each direction shall be a minimum of 2½ inches in size and visible from the area of the call button.*

The audible signal shall sound once for "up" and twice for "down."

The centerline of the fixture shall be located a minimum of 6 feet above the floor so that it may be seen by a person seated in a wheelchair. In-car lanterns may be used if they meet the above criteria.

Door Jamb Markings: At each hoistway entrance (on both sides of the jamb), a floor designation shall be provided at a height of 60 inches (5 feet) above the floor. These designations shall be tactile (raised a minimum of 0.03 inches), in high contrast with the jamb wall, at least 2 inches high and visible from within the car and the elevator lobby. Permanently applied plates are acceptable.

Car Position Indicator and Signal: A car position indicator shall be located above the car operating

panel or over the door opening of each car. This indicator shows the position of the car in the hoistway by illuminating the number of the landing where the car is stopped or passing at the time. This may be a LED (Light Emitting Diode) display. The indicator numbers shall be in high contrast to the background and shall be a minimum of ½ inch in height.

Handrails: Although not required by the new ANSI A117.1 (1980), handrails assist those with semi-mobility handicaps. A handrail, if desired, should be provided on at least two sides of the car (preferably on one side and the rear of the car). They shall be smooth and the inside surface shall be 1½ inches from the car wall. They shall be mounted at 32 to 33 inches above the car floor. **Note:** *This shall not interfere with any controls as the lowest control is 35 inches above the floor.*

Audible Floor Passing Signals: An audible signal can be provided to indicate that the car is passing a floor. This signal can be subject to a special button in the car operating panel which, when pushed, would indicate to a blind passenger that the car was either stopping at or passing a floor served by the elevator. This special button will restrict the signal to sounding for a trip in one direction when the button was activated.

Elevator Car Button: The highest button inside the car should be 54 inches above the floor and the lowest button 35 inches above the floor. The emergency group shall be located on the lowest part of the panel. Visual indication should show each call registered and be extinguished when the call is answered. Markings should be adjacent and to the left of the control on a contrasting color background. Letters or numbers shall be a minimum of ½ inch high raised or recessed .03 inches.

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There has been some disagreement as to whether Braille should be used to identify the buttons in elevators. But many blind people cannot read Braille and those who can, can also identify raised numbers. Therefore, it appears that Braille is an extra expense that is not required. If Braille is used, the plates should be attached without protruding small rivets or screws, as they could be misleading to a Braille reader.

Chapter 5

RESTROOMS

Restrooms

- ☑ One male and one female restroom shall be provided on the same level as the accessible building entrance, or, if there are no restrooms on that level, on the next closest accessible level with restrooms. If a building currently does not contain restrooms for anybody, it is not necessary to provide them solely for the handicapped.
- ☑ For a restroom to meet accessible design criteria, it must be on an accessible floor and have an accessible entrance as well as meeting the basic criteria listed below.

If there are existing curtains on the accessible stalls, they shall be acceptable if the stall is a minimum of 4 feet 3 inches long by 3 feet wide and meets all other criteria. This is not a recommended solution as it does not provide the same degree of privacy and the curtains are an easy target for vandals, but the Office of Civil Rights accepts it as a solution because of the lower initial modification cost.

If an existing male restroom has a stall that meets the minimum criteria, it is not necessary to modify a urinal in that restroom.

As toilet seat heights are changed in the new ANSI standard, it should not be necessary to modify seat heights that fall within the range of 17 to 20 inches above the floor.

In large buildings where a disabled person might have to travel an inordinately long distance on one floor, and if there are several male and female restrooms on each floor, then consideration should be given to making additional restrooms accessible.

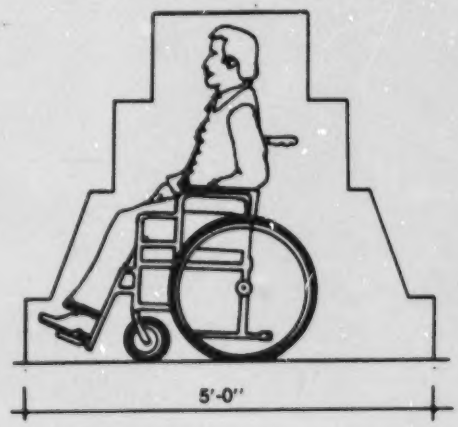
In buildings over five stories high, a restroom for each sex should be provided every fifth story. This is a general rule, but it should also reflect the needs of the institution and the specific building. This rule of thumb is not meant to reflect the time that a disabled person needs to get to a restroom but rather the number of accessible facilities needed as a minimum in a modified facility.

A unisex restroom is also acceptable if it meets the appropriate criteria and:

- is acceptable by local or state code
- is usable by everyone and is not set aside for the disabled

Note: *The 5 feet by 5 feet turning space can be reduced above the floor level as shown by this diagram. This will allow placement of lavatories and other restroom accessories in this area without violation of the 5 feet by 5 feet requirement.*

Wheelchair Turning Clearances



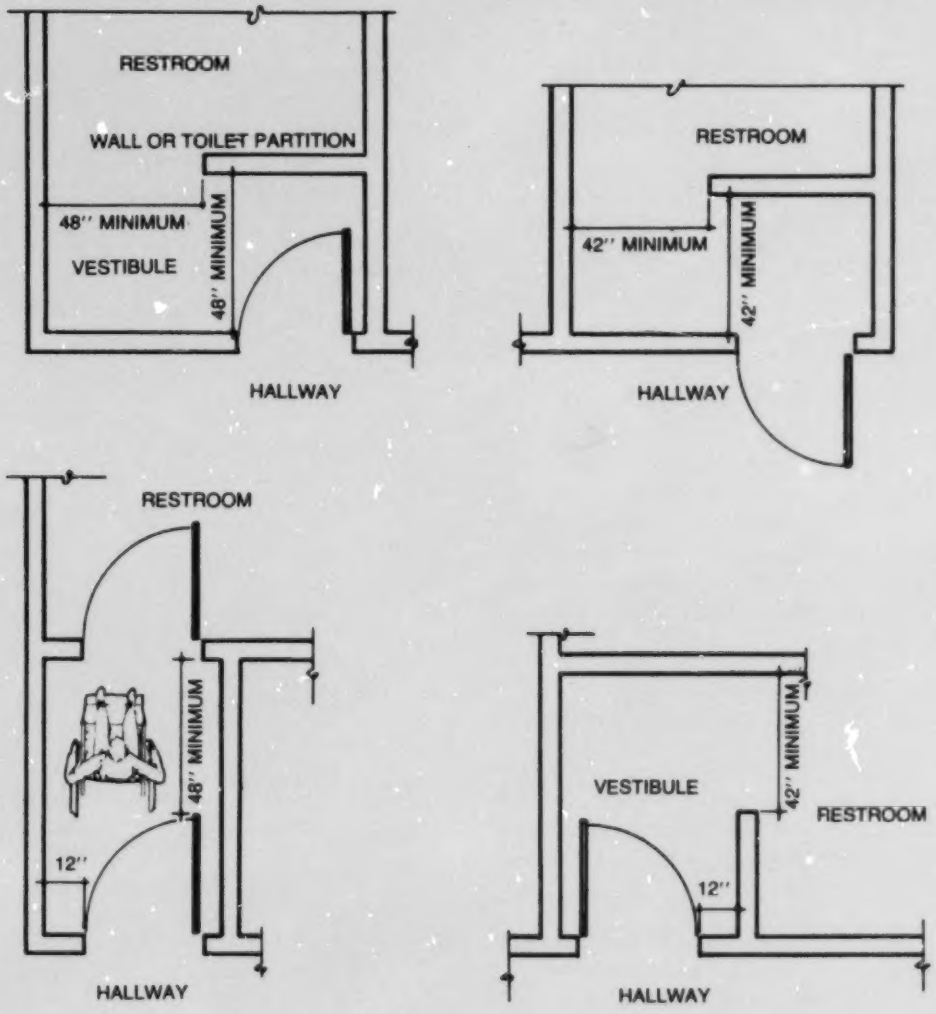
The Entranceway and Restroom Floor Layout

☑ Restroom entrance door must have at least a 32 inch clear opening (see Chapter 3/Doors).

☑ Internal passageway vestibule (if required) must allow access (see illustrations below).

☑ There should be a place in the restroom where 5 feet by 5 feet level clear floor area exists (see sketch, page 39).

Restroom Floor Layouts

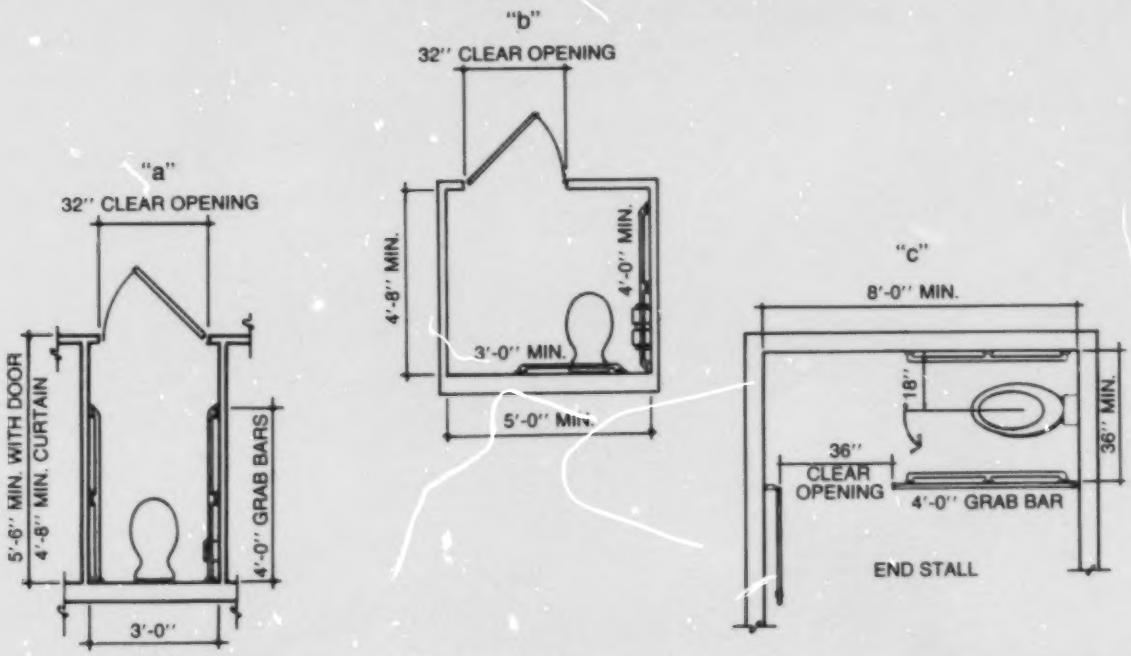


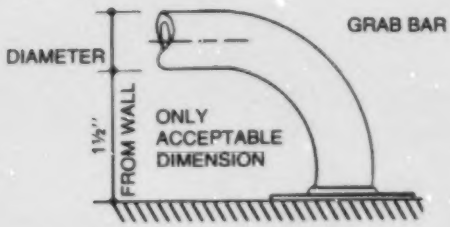
Toilet Stalls

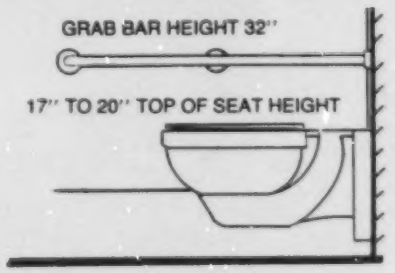
- ☑ Stall door shall have a minimum 32 inch clear opening.
- ☑ Stall door: swing out (curtains in existing situations only)
- ☑ Stall size:
  "a" stall 3 feet wide by 5 feet 6 inches long, or
  "b" stall 5 feet wide by 4 feet 8 inches long, or
  "c" stall 36 inches wide by a minimum 8 feet long.
- ☑ Grab bars:
  "a", "c" stall mounted horizontally both sides,
  or
  "b" stall — L-shaped horizontal grab bar
- ☑ Toilet seat: 17 to 20 inches above floor level

Note: *An existing curtain is acceptable if the stall is a minimum of 4 feet 8 inches long by 3 feet wide and meets the rest of the criteria.*

Accessible Toilet Stalls







Note: An existing curtain is acceptable if the stall is a minimum of 4'8" long by 3'0" wide and meets the rest of the criteria.

Showers

There are two types of shower stalls that the disabled can use. The first is a roll-in shower. This type must not have a water retaining curb. The person using this type of shower stall takes either the wheelchair or a special shower chair into the shower. The shower stall must be large enough to contain the wheelchair. The controls shall be in reach as shown below, and the space in front of the shower should contain ample room for maneuvering.

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The second type of accessible shower is the 3 feet by 3 feet stall shower where a disabled person will transfer to a fold-down or permanent seat. In this case, the shower can have a water retaining curb, but it should be no higher than 2 to 4 inches so that the foot rests of the wheelchair can clear the curb when transferring a person to and from the seat.

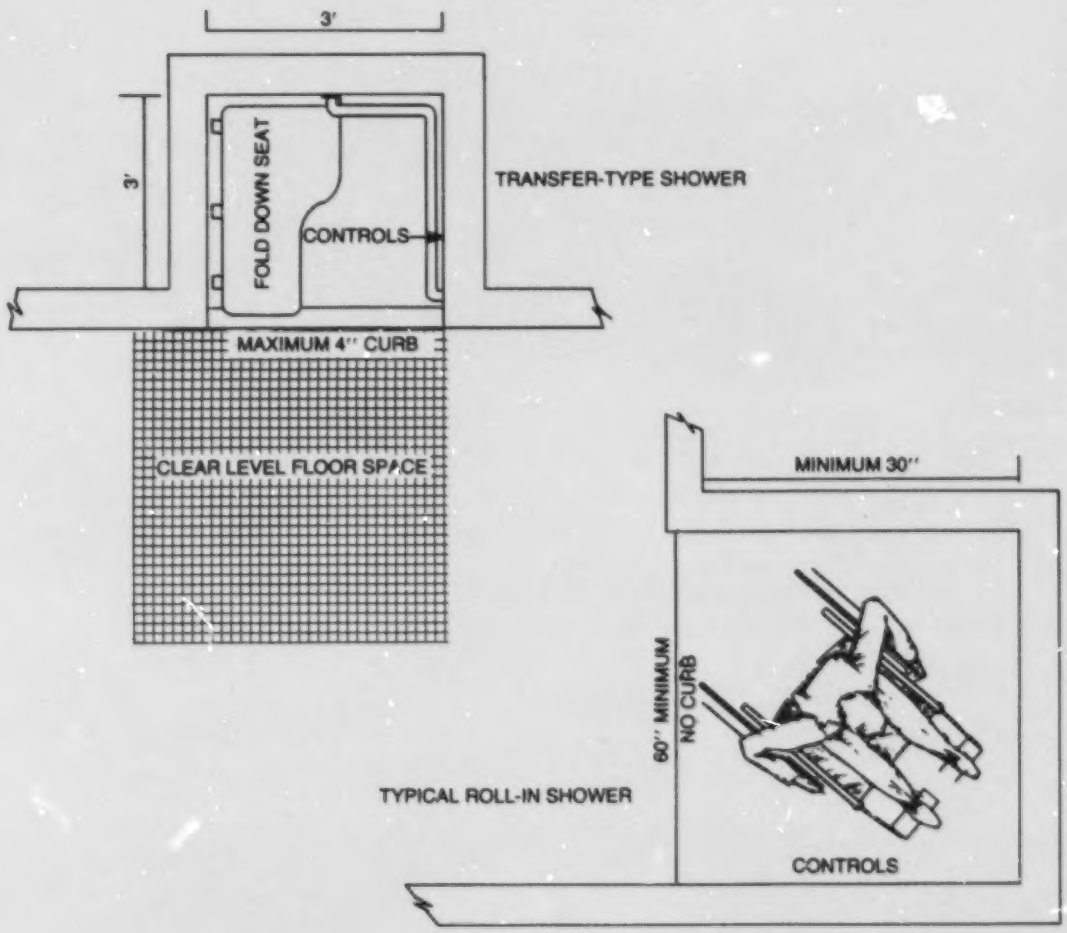
Bathtubs

Although most people with mobility disabilities prefer showers where they can transfer to a shower seat or take a shower in a shower chair, a bathtub can also be used. There are several tub seats available, ranging from a simple seat that spans the width of the tub to a more elaborate one that allows transfer from a wheelchair to the seat and then into the tub.

Lavatories and Restroom Accessories

- ☑ Top of lavatory 31 to 34 inches as shown
- ☑ Height under apron or lavatory 27½ to 30 inches (as shown on page 44)

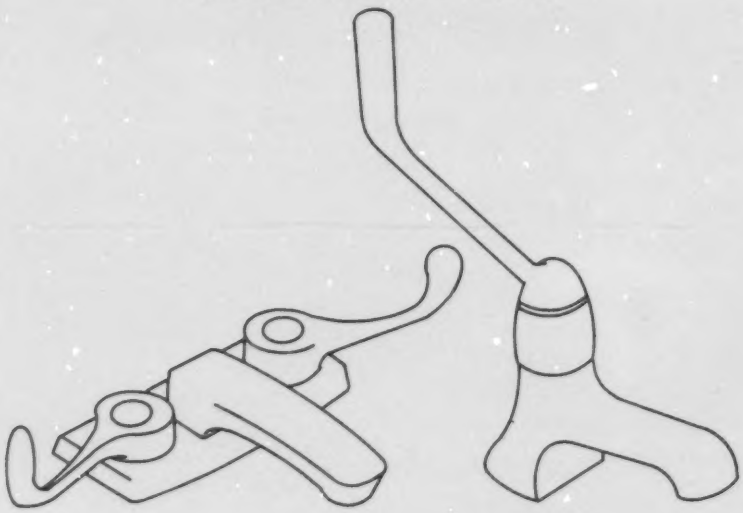
Accessible Showers



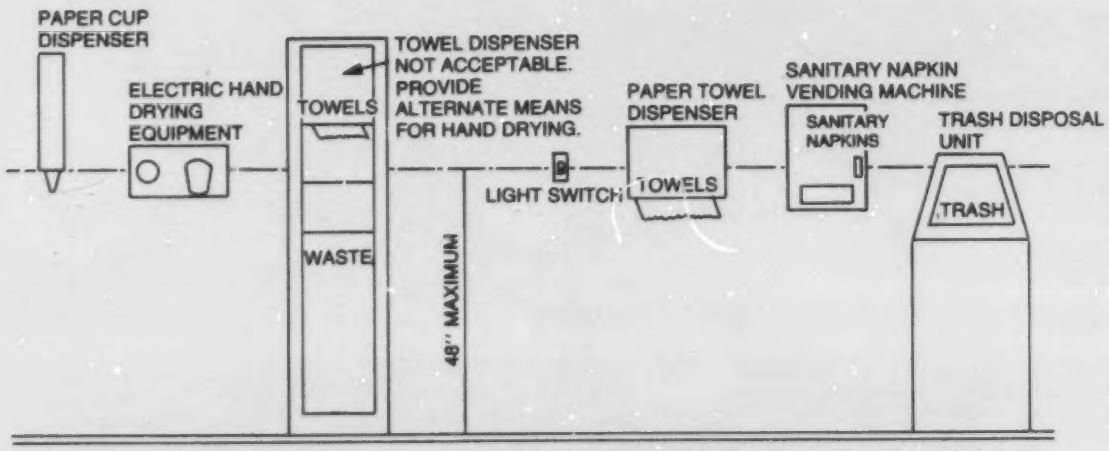
- ☑ Accessible handle for faucet (as shown below)
- ☑ Towels and dispensers 48 inches above the floor (as shown below)
- ☑ Drain pipes protected or insulated if 120° or greater
- ☑ Mirror mounted with bottom no higher than 40 inches above the floor or tilted mirror
- ☑ Maximum 18 inches from lavatory front to faucet (as shown on page 44)

Note: *If possible, the towel dispensers should not be located where a person has to reach over the lavatory. The towel dispenser also should not be located across the restroom, but rather on the wall adjacent to the lavatory. This frees a person using a wheelchair from having to use wet hands to propel the wheelchair to the towel dispenser.*

Accessible Handles for Faucets

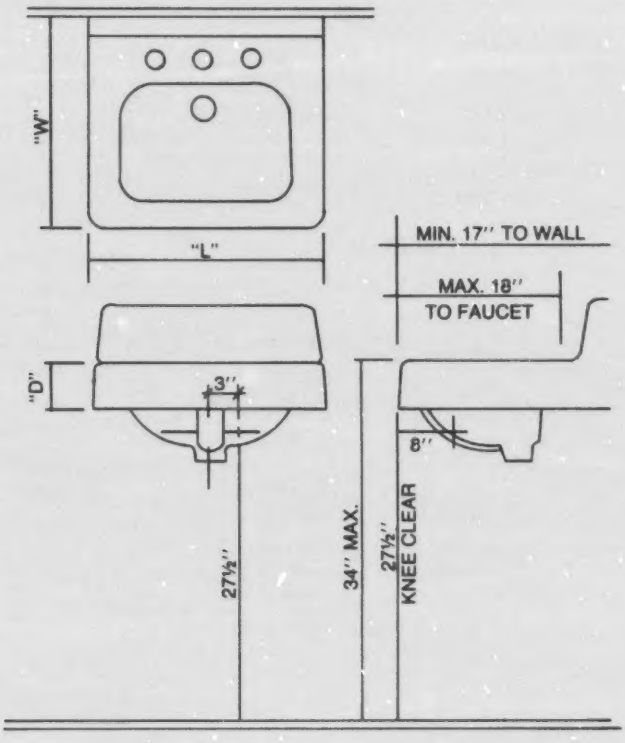


Controls Within Reach



Note: Highest operable part shall be centered on or below 48".

Accessible Lavatory Dimensions



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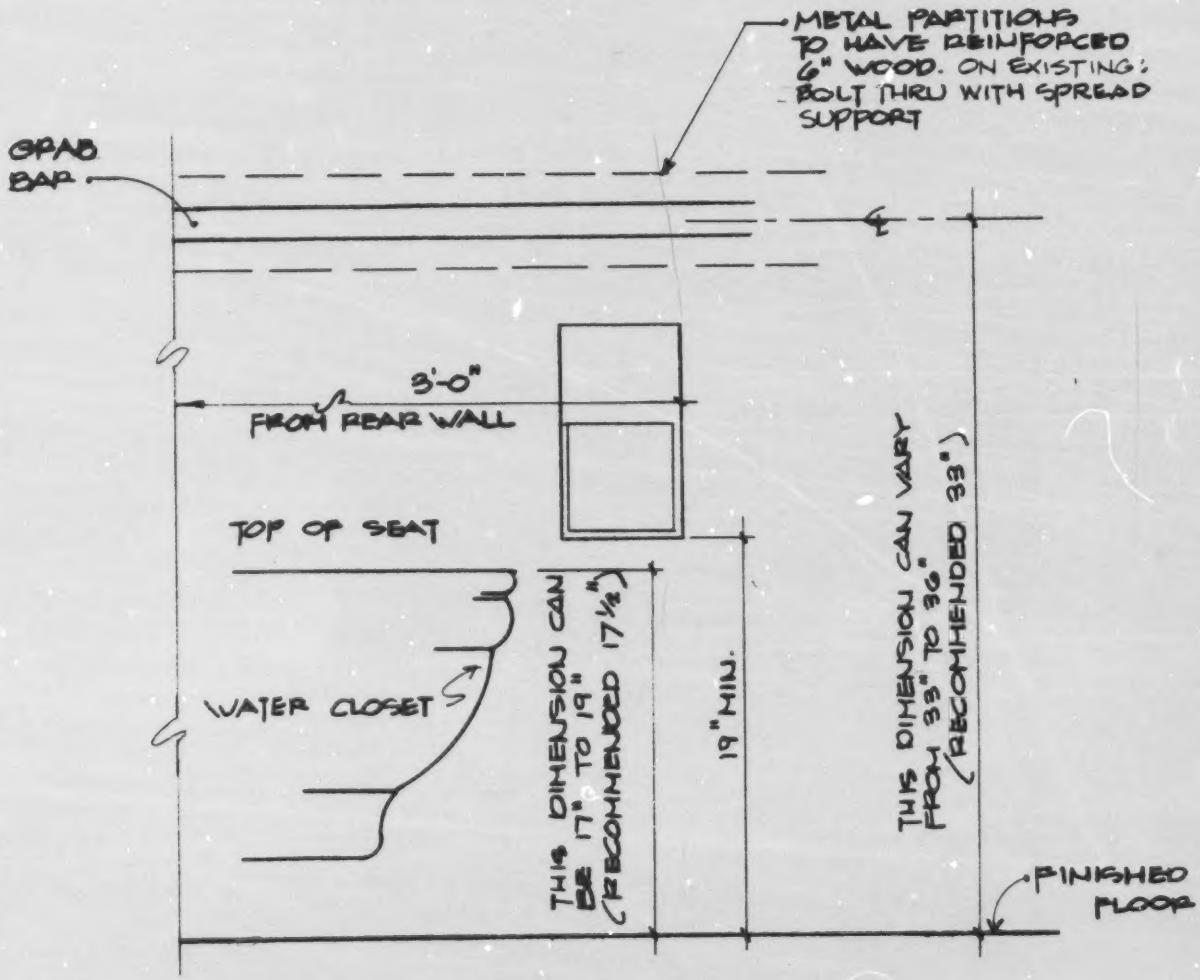
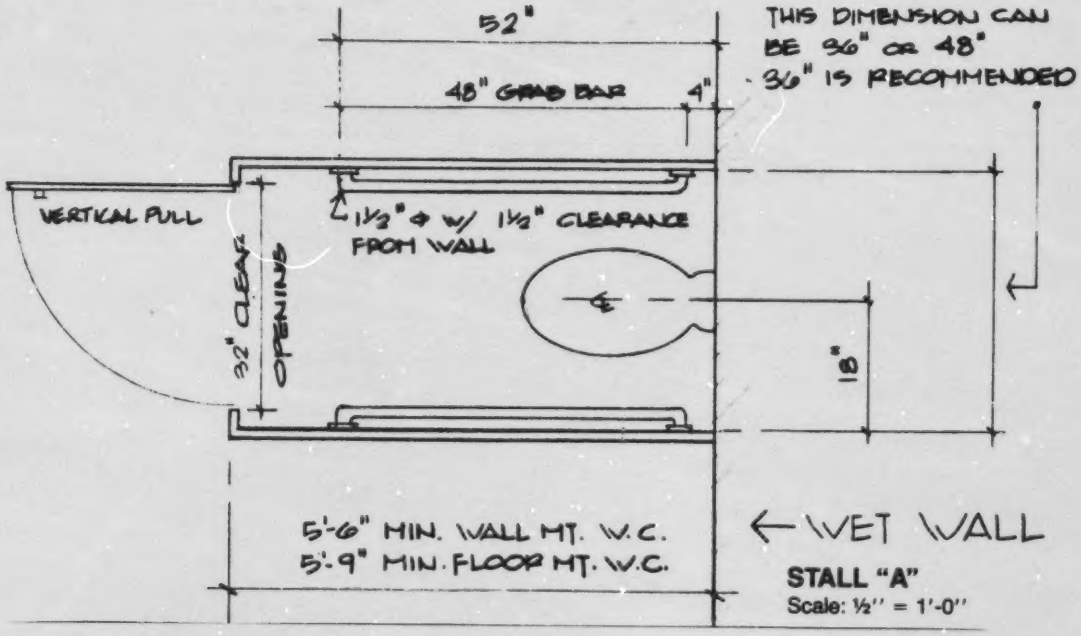
NOTE:
TOILET TISSUE DISPENSER SURFACE MOUNTED SO THAT TOP CAN BE OPENED TO REPLACE TISSUE, WITHOUT HITTING GRAB BAR


METAL PARTITIONS TO HAVE REINFORCED 6" WOOD. ON EXISTING: BOLT THRU WITH SPREAD SUPPORT
GRAB BAR
3'-0" FROM REAR WALL
TOP OF SEAT
WATER CLOSET
THIS DIMENSION CAN BE 17" TO 19" (RECOMMENDED 17½")
19" MIN.
THIS DIMENSION CAN VARY FROM 33" TO 36" (RECOMMENDED 33")
FINISHED FLOOR

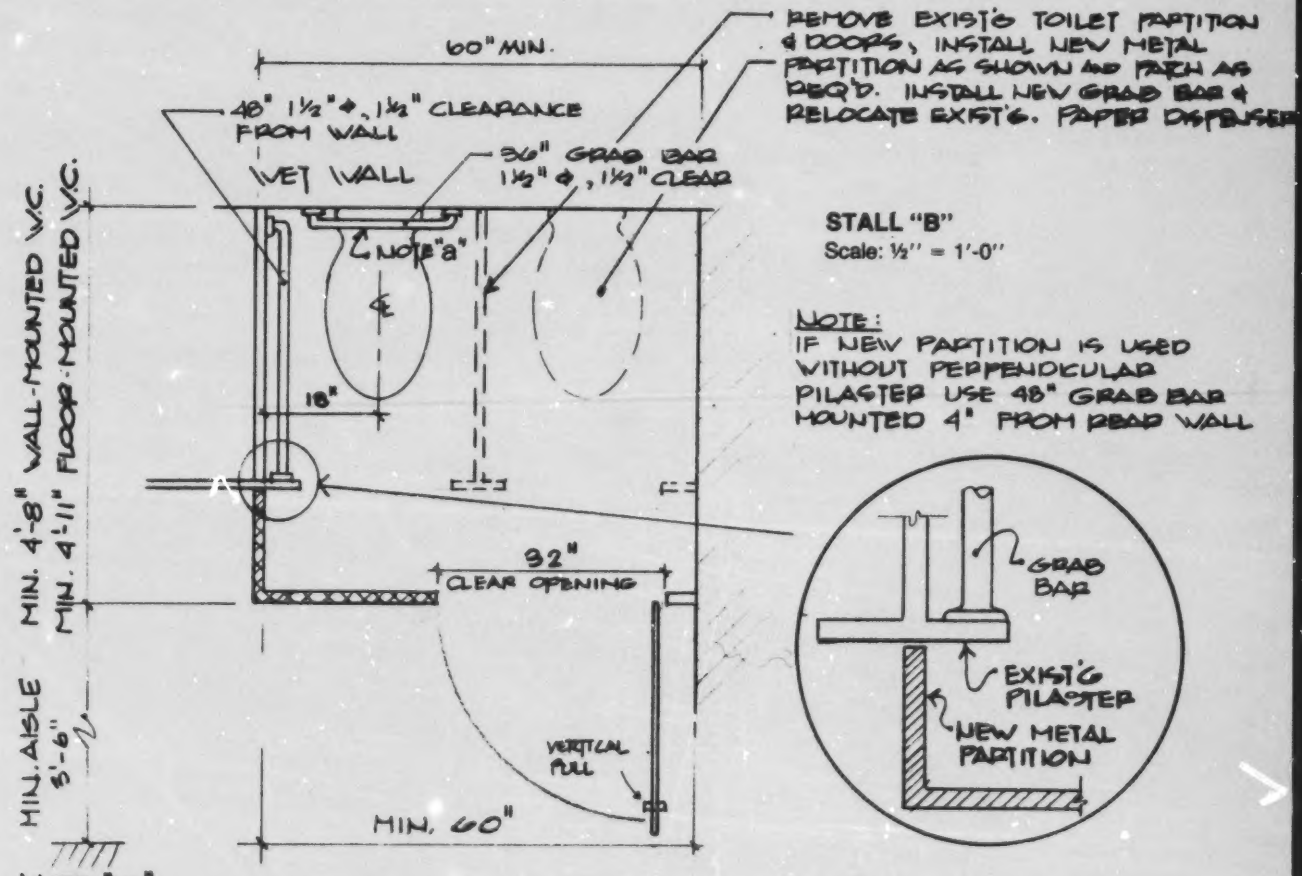
45

TYPICAL TOILET STALL DETAIL
Scale: 1½'' = 1'-0''

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



STALL "A"
Scale: ½" = 1'-0"

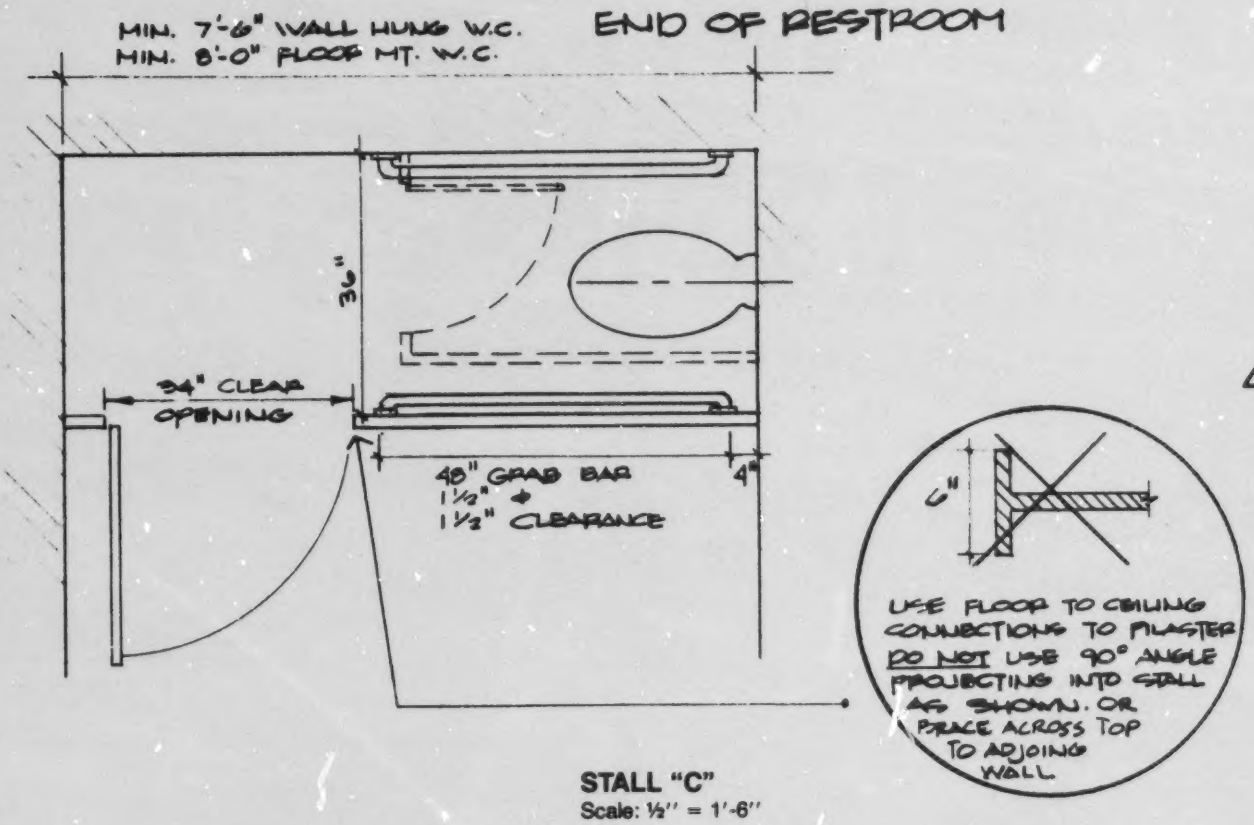

60" MIN.
REMOVE EXIST'G TOILET PARTITION & DOORS, INSTALL NEW METAL PARTITION AS SHOWN AND PATCH AS REQ'D. INSTALL NEW GRAB BAR & RELOCATE EXIST'G. PAPER DISPENSER
48" 1½"ϕ, 1½" CLEARANCE FROM WALL
WET WALL
36" GRAB BAR 1½"ϕ, 1½" CLEAR
NOTE "a"
18"
32" CLEAR OPENING
MIN. 4'-8" WALL-MOUNTED W.C.
MIN. 4'-11" FLOOR-MOUNTED W.C.
MIN. AISLE 5'-6"
VERTICAL PULL
MIN. 60"
GRAB BAR
EXIST'G PILASTER
NEW METAL PARTITION

STALL "B"
Scale: ½" = 1'-0"

NOTE:
IF NEW PARTITION IS USED WITHOUT PERPENDICULAR PILASTER USE 48" GRAB BAR MOUNTED 4" FROM REAR WALL

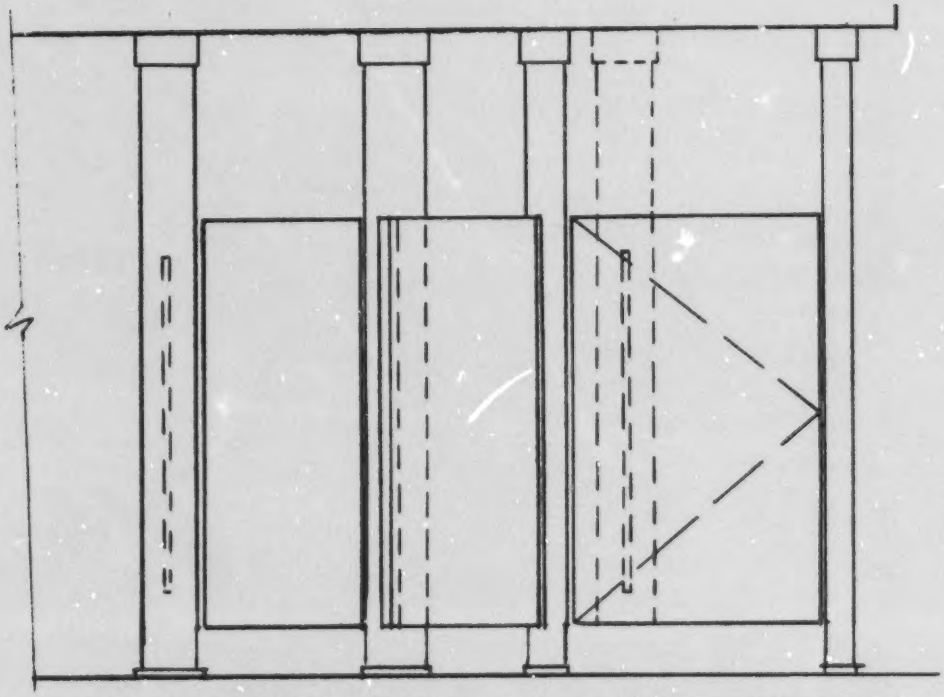
NOTE "a"
IF FLUSH VALVE INTERFERES WITH GRAB BAR, 2-12" x 1½"ϕ, 1½" CLEARANCE MAY BE USED.

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to ensure that all local and state building codes are met.


MIN. 7'-6" WALL HUNG W.C.
MIN. 8'-0" FLOOR MT. W.C.
END OF RESTROOM
36"
34" CLEAR OPENING
40" GRAB BAR
1½" ↔
1½" CLEARANCE
4"
6"
USE FLOOR TO CEILING CONNECTIONS TO PILASTER
DO NOT USE 90° ANGLE PROJECTING INTO STALL AS SHOWN. OR PLACE ACROSS TOP TO ADJOING WALL

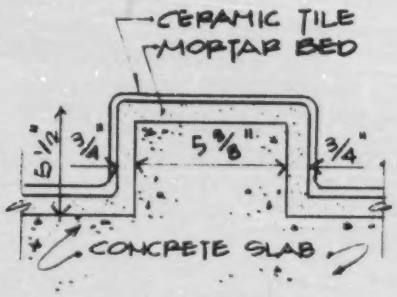
47

STALL "C"
Scale: ½" = 1'-6"



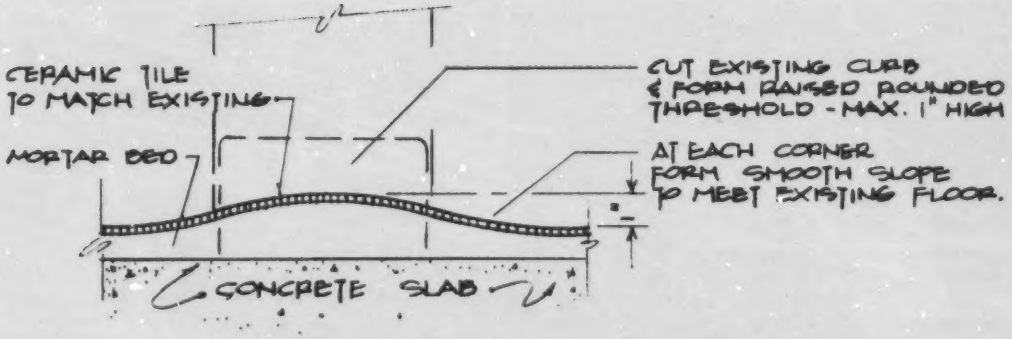
TYPICAL CONVERSION FROM 2 STALLS INTO 1 ACCESSIBLE STALL

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



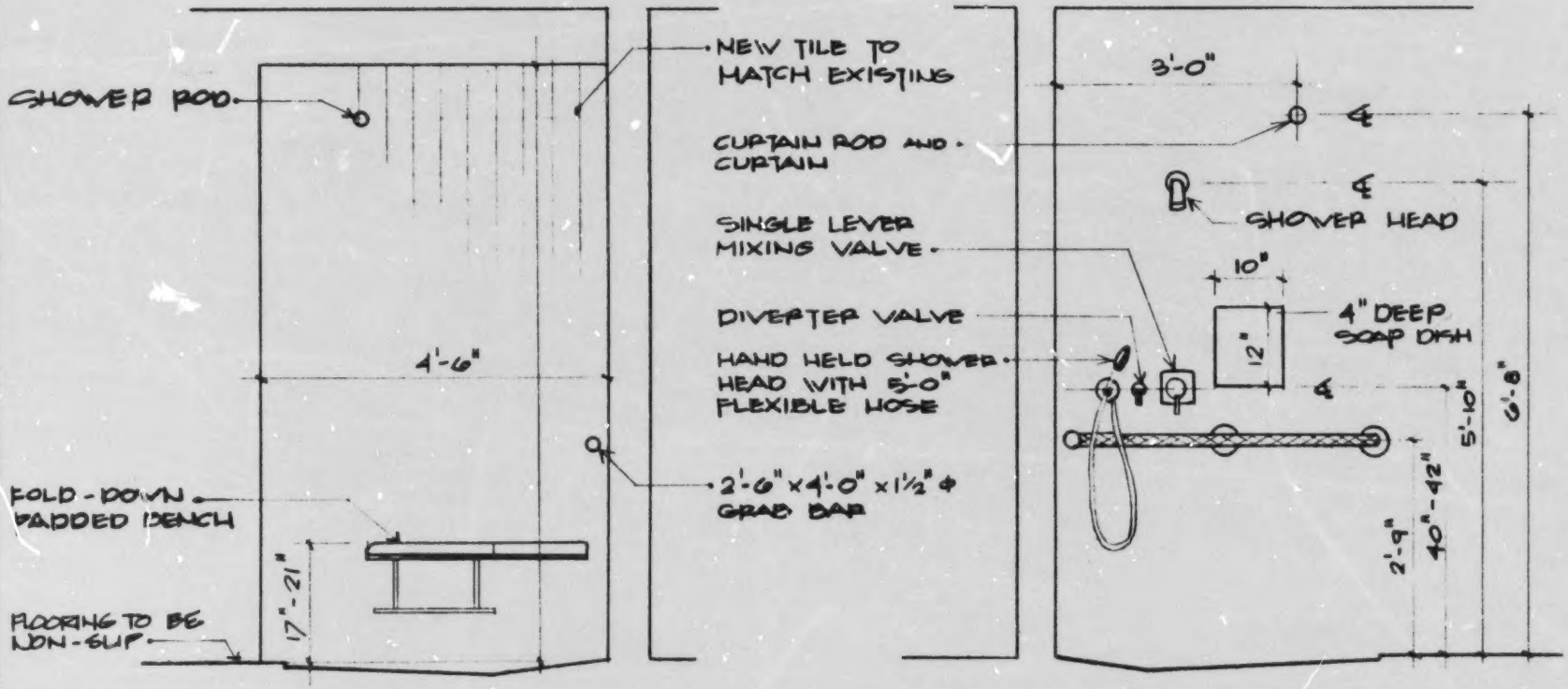
TYPICAL EXISTING SHOWER CURB
Not to scale

48



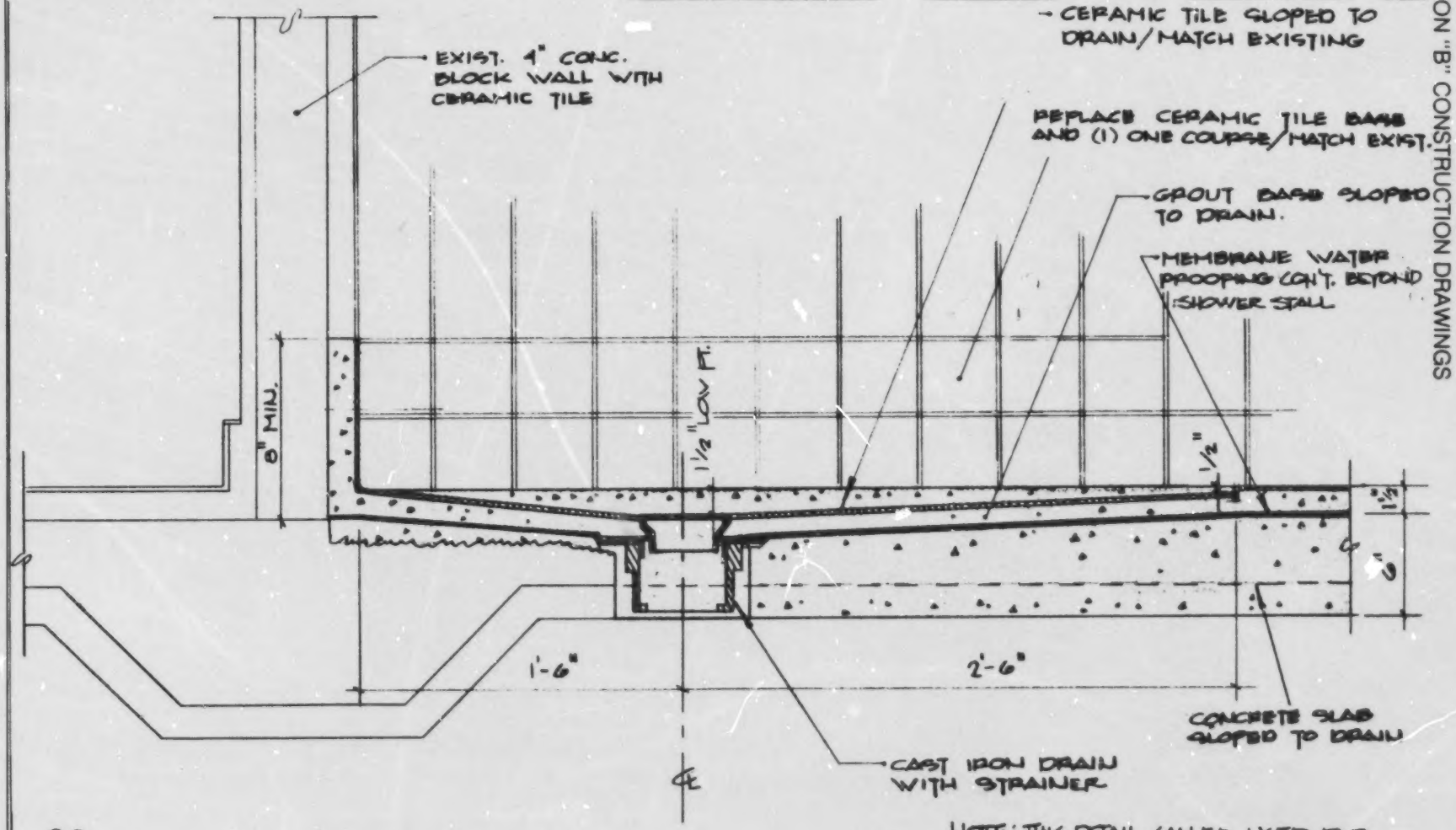
MODIFIED ACCESSIBLE SHOWER CURB
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



SHOWER "A" TRANSFER (NO CURB)

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.


CERAMIC TILE SLOPED TO DRAIN/MATCH EXISTING
EXIST. 4" CONC. BLOCK WALL WITH CERAMIC TILE
REPLACE CERAMIC TILE BASE AND (1) ONE COURSE/MATCH EXIST.
GROUT BASE SLOPED TO DRAIN.
MEMBRANE WATER PROOFING CON'T. BEYOND SHOWER STALL
8" MIN.
1½" LOW PT.
1½"
1'-6"
2'-6"
CONCRETE SLAB SLOPED TO DRAIN
CAST IRON DRAIN WITH STRAINER
℄

NOTE: THIS DETAIL CAN BE USED FOR EITHER TRANSFER OR ROLL-IN STALLS

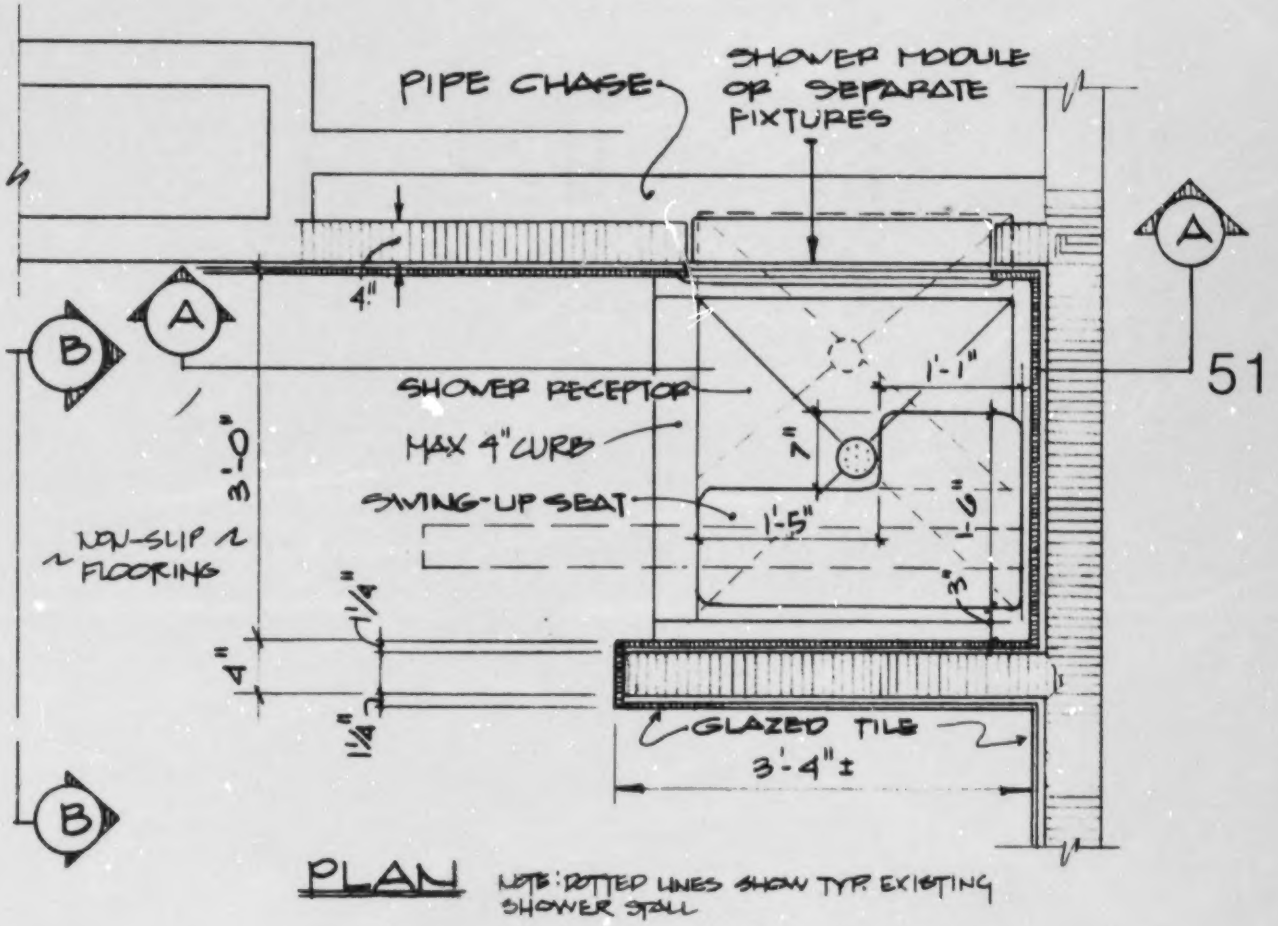
"A" SHOWER DETAIL

Scale: 1" = 1'-0"

63

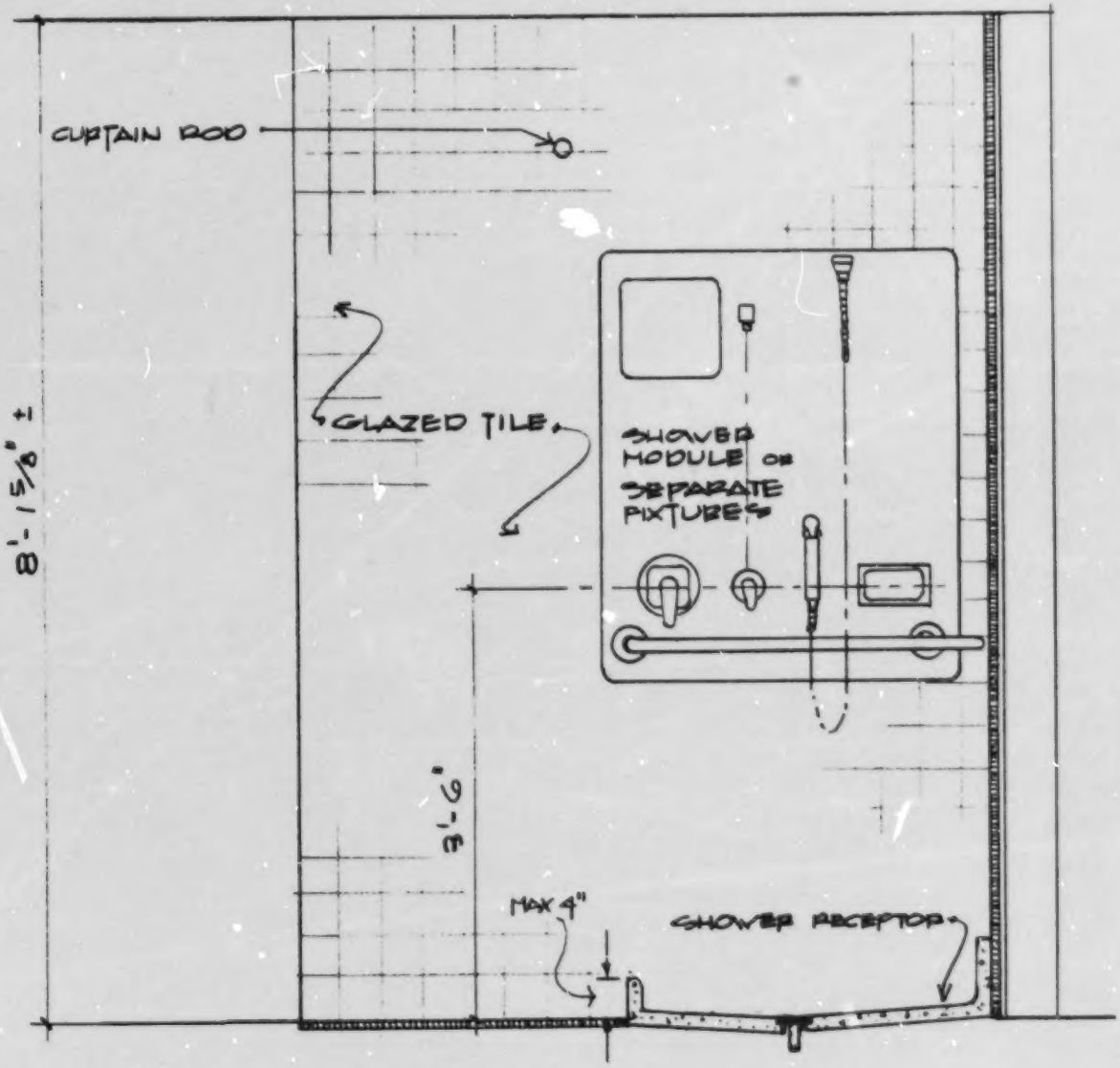
64

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



"B" SHOWER DETAIL
Scale: ¾" = 1'-0"

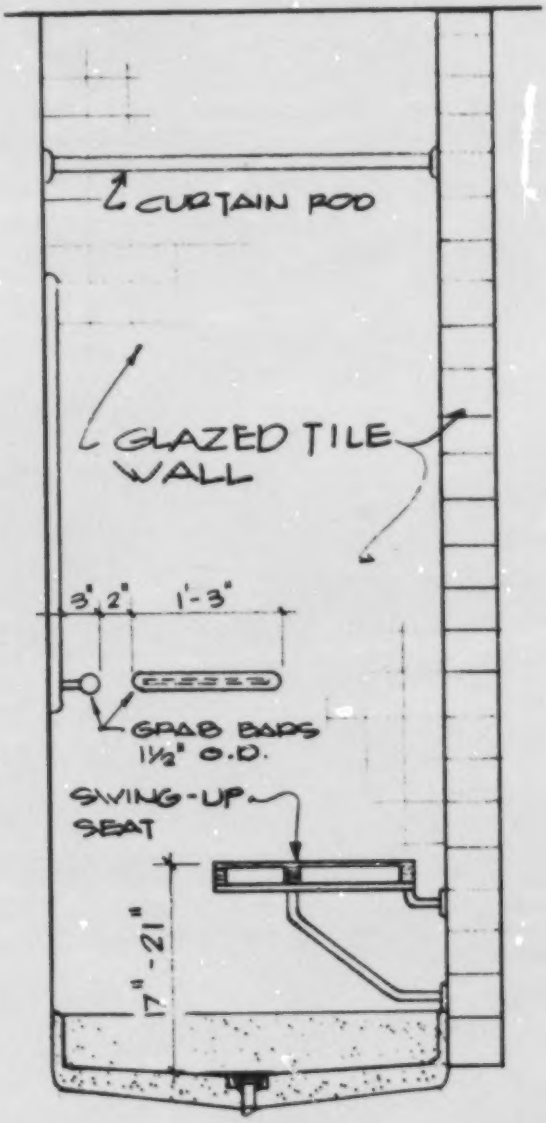
Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



ELEVATION (A) - (A)

"B" SHOWER DETAIL
Scale: ¾" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



ELEVATION Ⓑ · Ⓑ

"B" SHOWER DETAIL
Scale: ¾" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Attaching Grab Bars

In the past, little attention has been paid to the fastening of grab bars to the walls and partitions in restrooms. Because of this, in some instances, grab bars have pulled from the wall or become loose. The most secure way of fastening the grab bar is to install a steel plate in the structural system of the wall and bolt the grab bar to the steel plate. Bolting into solid wood structural members provides the next best alternative.

For metal and plastic laminate toilet partitions, thru bolting should be used (with spreaders used in the metal partitions).

If thru bolting with steel plates is not feasible, heavy duty anchor shields should be used.

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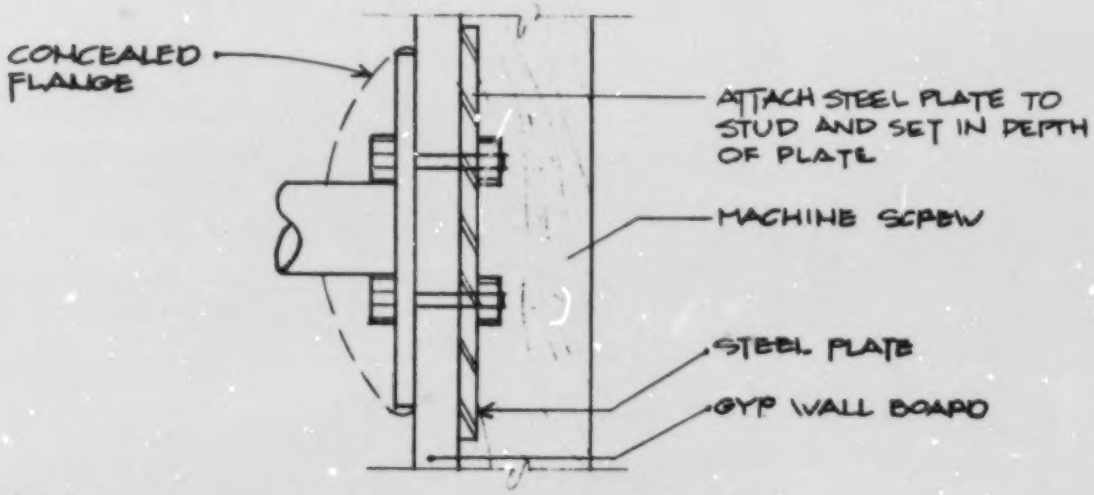
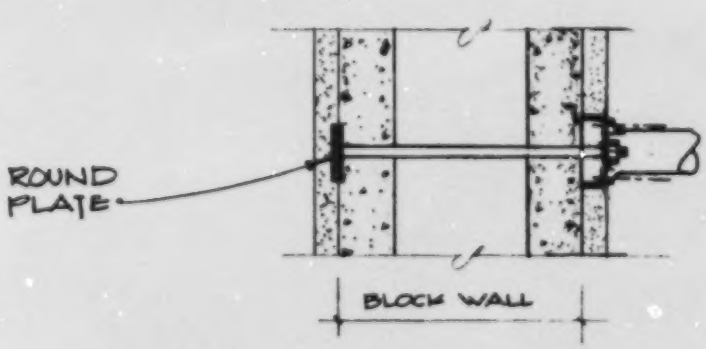


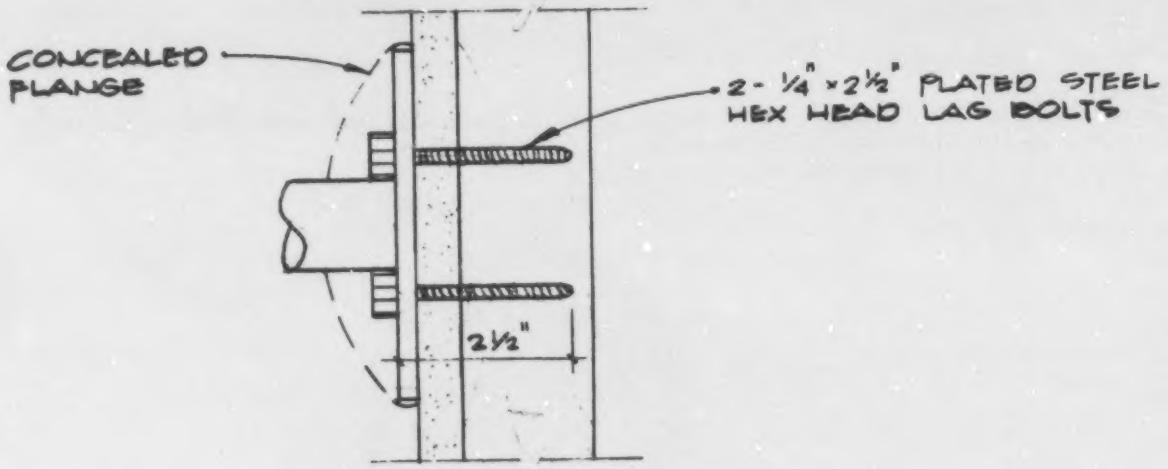
NOTE:
THE BEST METHOD FOR INSTALLATION IN WOOD OR METAL STUD WALLS IS "IN-WALL" BETWEEN STUD OR UNIVERSAL ANCHOR PLATES. FASTEN TO STUDS BEFORE WALL IS APPLIED. RECESS AS REQUIRED FOR FLUSH FINISH WALL APPLICATION.

STUD WALLS WITH STEEL PLATE
Not to scale



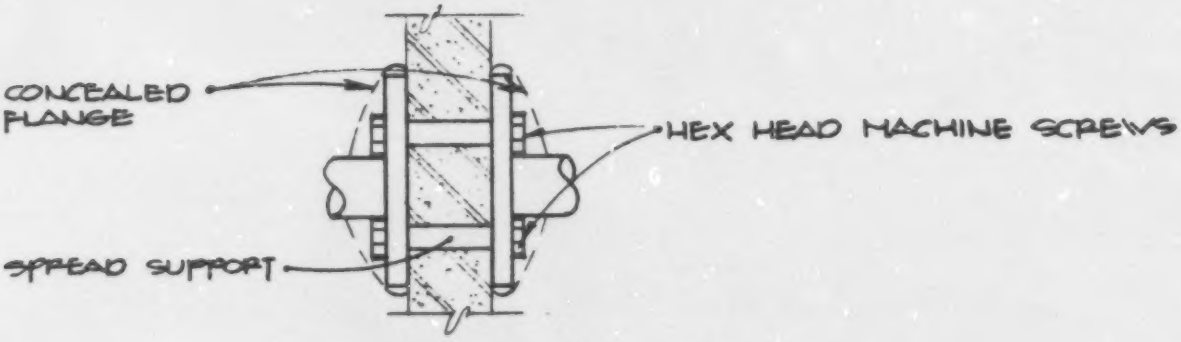
BLOCK OR MASONRY WALLS
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



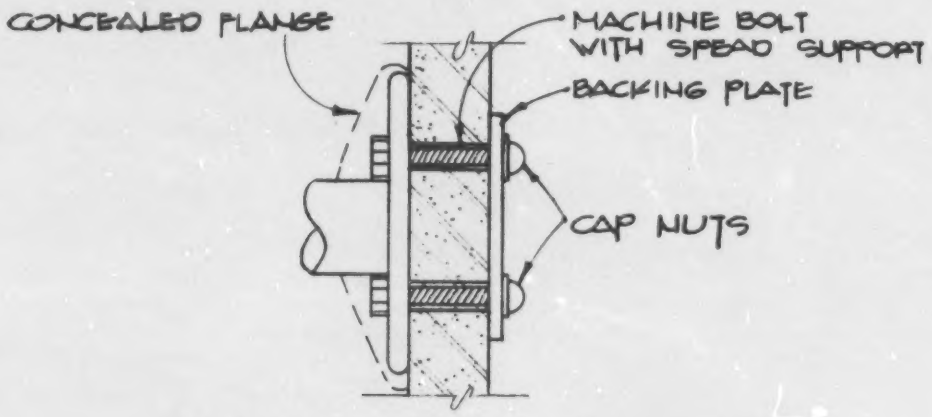
55

STUD WALLS WITH WOOD SUPPORTS
Not to scale



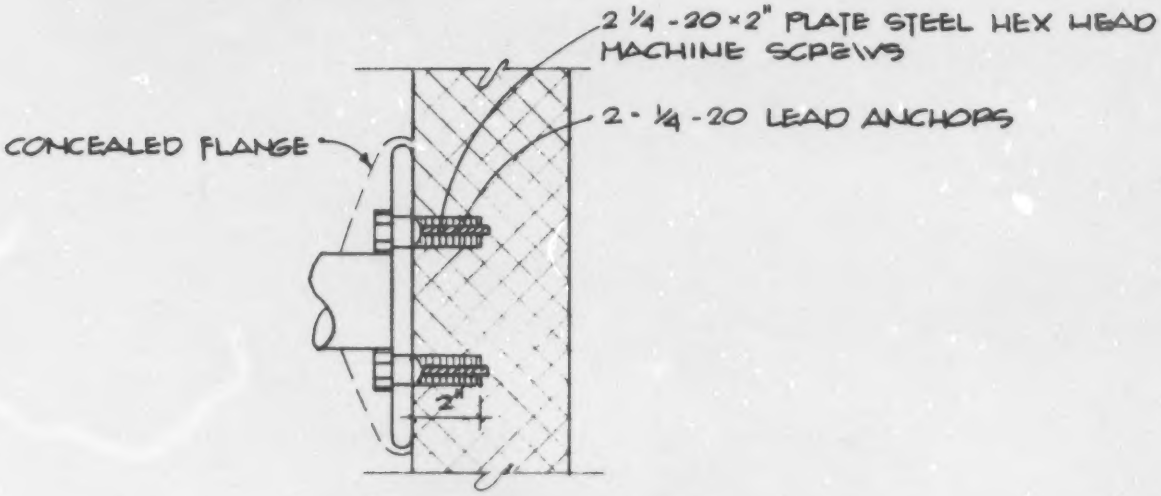
ANCHORING DEVICE AT METAL PARTITION
BACK TO BACK GRAB BARS
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



56

ANCHORING DEVICE AT METAL PARTITION WALL
Not to scale



ANCHORING DEVICE AT MASONRY WALL
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Lavatory Selection and Criteria

The most universal and easily used lavatory allows a person's legs to project under the lavatory. This front approach is preferred by most people because it permits closer access to the bowl and faucets. Most people find it comfortable to sit 4 to 8 inches from the front apron of the lavatory.

To allow clearance for a person's knees under the lavatory, a clear unobstructed space of 27½ inches above the floor measured back from the front apron a minimum of 8 inches should be provided. This will allow a person using a wheelchair to come within 5 inches of the front apron. This 5 inch distance is measured from the front of the apron to the person's midriff. The knee clearance of 27½ inches above the floor should be measured back from the front apron 8 inches until the front face of the bowl is encountered. The clearance should not be measured to the face of the front overflow part of the bowl, but 3 inches off the centerline of the lavatory, because a person's knees are not normally held firmly together but are separated slightly. If the bottom of the front apron is located at 29 inches above the floor, those using bench type arms on their wheelchairs can get even closer.

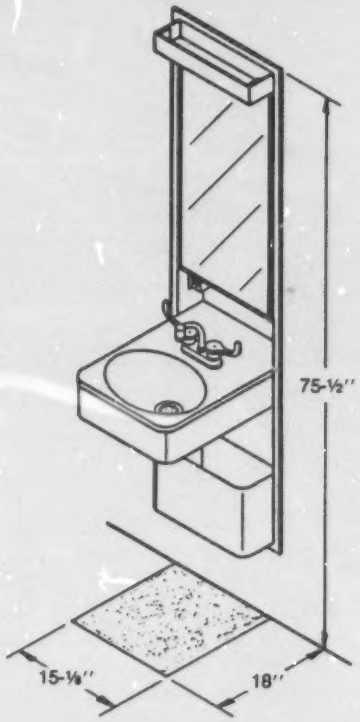
The preferred height of the rim of the lavatory is 32 inches above the finished floor, but most of the lavatories manufactured today will not allow this 32 inch height to be met without violating the 27½ inch knee clearance. A *maximum* rim height of 34 inches above the floor is acceptable if the 27½ inch knee clearance cannot be met with the 32 inch top height.

The lavatory shall project a minimum of 17 inches from the wall, so that the person using a wheelchair can get close to the lavatory front apron without the footrests of the wheelchair hitting the rear wall.

There are three types of lavatories that can be used to provide accessibility:

Wall Hung: (Vitreous china or enameled cast iron lavatories). These units can be hung with wall hangers or chair carriers with concealed or exposed arms. When an existing lavatory is replaced, it should be checked to determine whether the replacement lavatory will fit on the existing chair carrier (in which the height can be adjusted), or whether a new carrier will be required.

Stainless Steel Combination Unit



57

There are several 20 inch by 27 inch wheelchair lavatories currently available. These units require a chair carrier and take up 9 inches more space than a standard 20 inch by 18 inch unit. This space requirement could be a problem in a small restroom, and some disabled people have complained that these units are difficult to use.

Stainless Steel Combination Units: These units can come with towel dispensers, mirrors, soap dispensers, blade or lever handles, and trash dispensers. They are rectangular and have protected drains concealed within the unit. The lavatory projects out 17½ to 22 inches from the wall and the narrow width allows close approach.

Countertop Lavatories: This type of lavatory can be accessible if the countertop is designed without a deep apron. The same clearance restrictions that apply to wall hung units apply to countertop units. The main advantage with a countertop unit is that an extra 2 or 3 inches of higher clear space can be obtained in front because the lavatory bowl is set back from the front apron.

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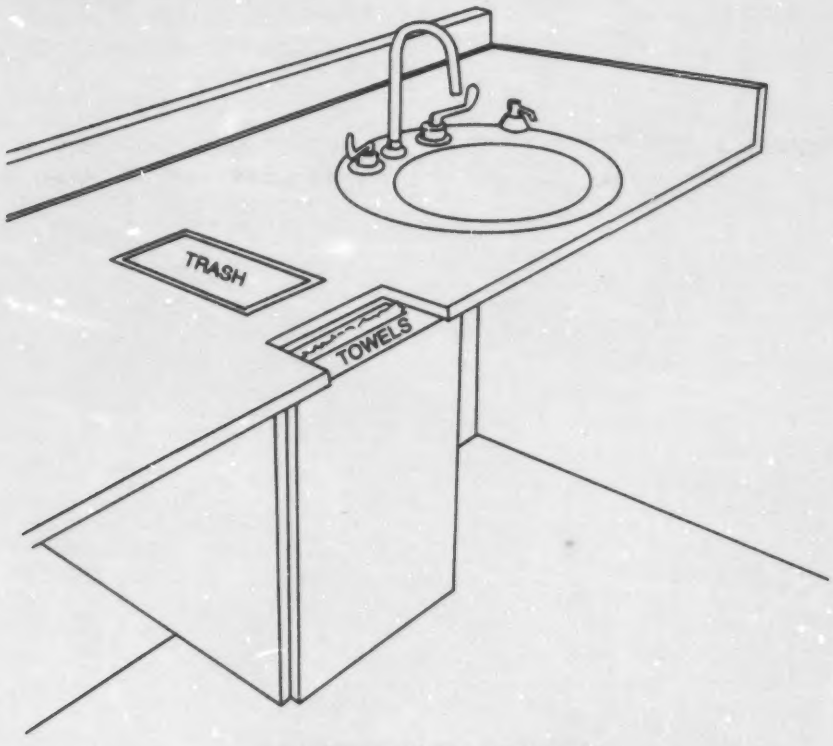
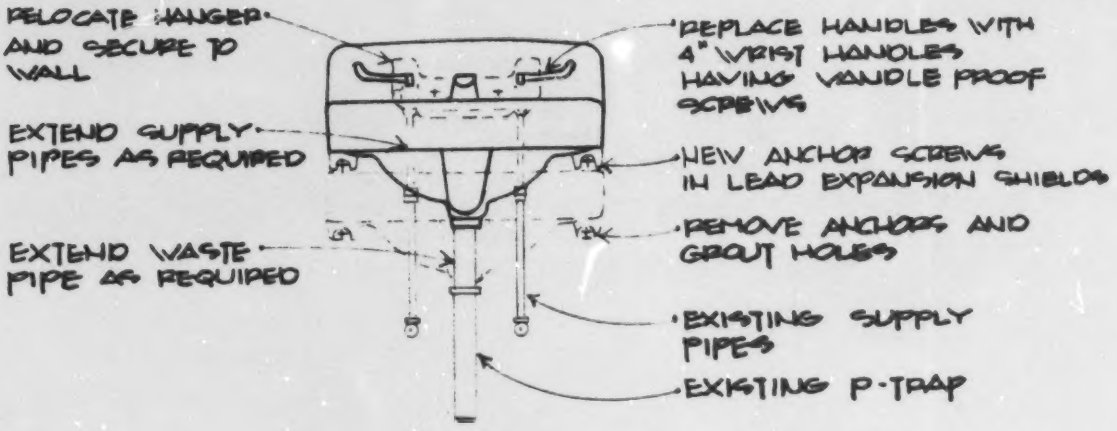


COUNTERTOP LAVATORY

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.


RELOCATE HANGER AND SECURE TO WALL
EXTEND SUPPLY PIPES AS REQUIRED
EXTEND WASTE PIPE AS REQUIRED
REPLACE HANDLES WITH 4" WRIST HANDLES HAVING HANDLE PROOF SCREWS
NEW ANCHOR SCREWS IN LEAD EXPANSION SHIELDS
REMOVE ANCHORS AND GROUT HOLES
EXISTING SUPPLY PIPES
EXISTING P-TRAP

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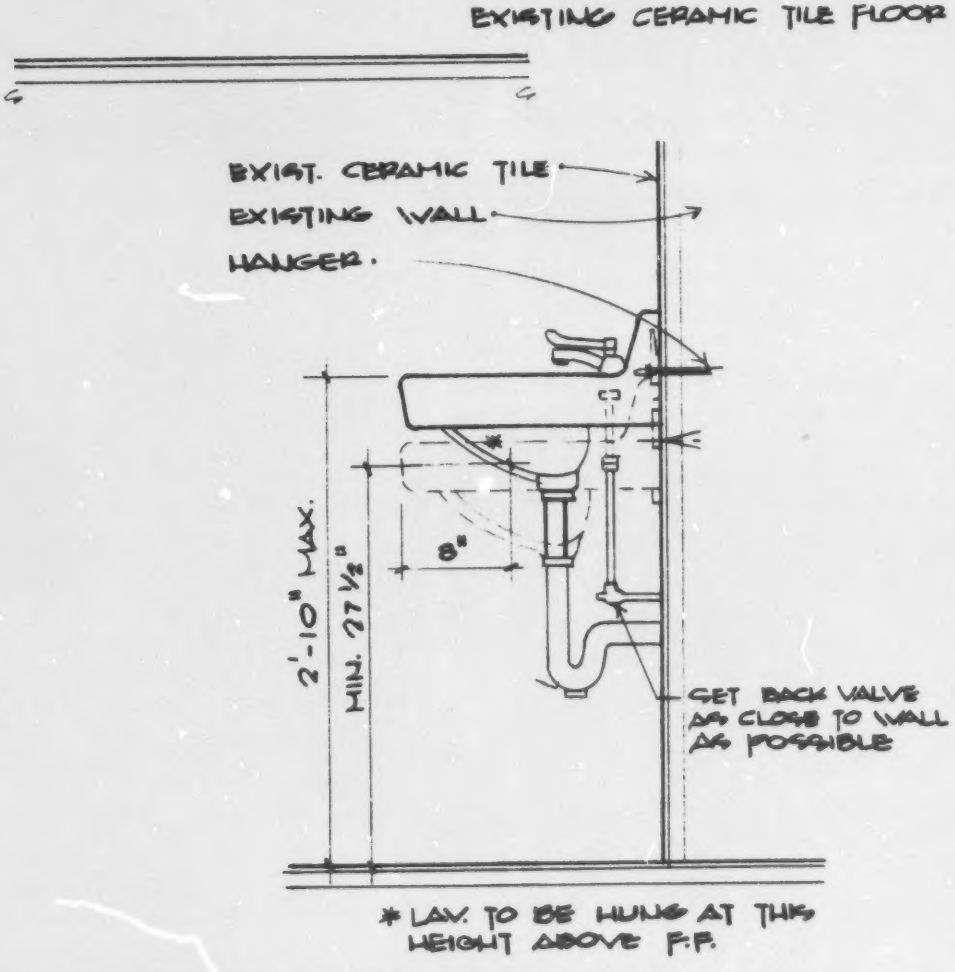

EXISTING TYPICAL LAVATORY MODIFICATION DETAIL
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Construction Specifications

The following specifications are not all inclusive. They represent certain standard items that should be included as applicable in any specification for restrooms that are to be made accessible.

Toilet and Shower Compartments: Constructed as drawn for toilet partitions except that door clear opening shall not be less than 32 inches wide and the door shall swing into the toilet room. Doors shall be equipped with special hardware of matching finish, and handles on both sides of the door shall be provided for ease of entry. Panels shall be reinforced for grab bars.

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Equip each new or remodeled compartment with a rubber tip coat hook, located no higher than 54 inches above the floor. Provide each door with slide bar latch and keeper. Hang doors on concealed gravity hinges. New hardware shall match existing hardware. Existing hardware may be reused where acceptable to architect. Provide theft-resistant fasteners for exposed accessory mountings.

Reinforcement: Reinforce walls and partitions for grab bars, towel dispensers, and folding seats.

Reinforcement shall be hardwood or steel plate. Provide 8 inch wide strips for grab bars, centered 2 feet, 9 inches above floor.

Water Closet Seat Lift and Seat: Water closet seat lift to include total integral unit consisting of independently hinged riser seat and independently hinged elongated open front seat. Solid plastic seat fitted with hollow core plastic lift to match the configuration of existing or new water closet and which raises the top of the seat above finished floor to 17½ inches. Hinge of seat to be check type. Both seat and lift to raise. Lift and seat to be white.

Note: *Wherever possible, the existing seats shall be disconnected and reused with the new lift. All existing items not reused shall revert to the owner.*

Shower Stalls and Shower Seats

Shower Stalls: 36 inches by 36 inches. An accessible shower stall shall be equipped with a hinged, fold-down, padded bench seat with retaining latch or hook-and-eye, which maintains an upright position when not in use, located at front edge of shower bench within easy reach of 18 inches (45.7 cm) in height from the stall floor level and mounted on the stall sidewall opposite that of the main showerhead and controls; shower controls using blade or lever type handles that are mounted no higher than 40 inches (101.6 cm) above stall floor level; a hose spray of at least 5 feet (152 cm) in length with a nozzle hook mounted 40 inches (101.6 cm) above the floor level; an accessible threshold of either not over ½ inch (1.27 cm) in height or ramped to conform to criteria; and a recessed soap dish and a utility area of at least 6 inches (15 cm) deep, 10 inches (25 cm) wide, and 12 inches (30.5 cm) high. All controls, showerheads, and recessed areas shall be located on the wall opposite the fold-down bench seat in this stall which has a maximum width of 3 feet (92 cm).

Folding Shower Seat: It shall fold up against the wall or down for seating. Frame, supports, and brackets shall be satin finish type 114 stainless steel. Seat shall be 2 inches thick Naugahyde-filled with rubberized hair, mounted on marine plywood.

Shower grab bars shall be located so as to permit the seat to be raised.

Grab Bars: Grab bars should be provided with a non-slip gripping surface.

- All grab bars shall have an outside diameter of 1½ inches.
- All grab bars shall have concealed mountings and be installed in strict accordance with manufacturers' recommendations.
- Bars shall be able to sustain a dead weight of 250 lb. for five minutes at any point.
- Sizes and shapes as indicated on drawings.

- Bar shall be 1½ inches from wall.
- Manufacturers shall furnish all plates, anchors, and fasteners required. Concealed items shall be noncorrosive.
- All exposed screws and bolts shall have theft-resistant fasteners.
- Shower grab bars shall be located so as to permit the seat to be raised.

Lavatory and Trim (Handicapped): Under each accessible sink there shall be a minimum knee clearance (taking into account both the counter apron and the bottom of the basin contour) of 27½ inches (69.8 cm) vertically for a horizontal distance of 8 inches (33 cm) from the front edge of the lavatory. The 8 inch horizontal measurement should be taken 3 inches from the centerline of the lavatory.

Drain pipes and hot-water pipes under a lavatory shall be covered or shielded to protect an individual in a wheelchair from burns.

Faucet handles for accessible lavatories shall be of blade type and be mounted no farther than 18 inches (45.7 cm) in reach from the front edge of the lavatory.

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Chapter 6

DRINKING FOUNTAINS

Drinking Fountains

Renal and urinary excretory systems function optimally when people are in an upright position and moving about. Because people in wheelchairs are deprived of this ability, their excretory functions are adversely affected. Their kidneys excrete larger than normal amounts of minerals and salts. Therefore, it is very important that large amounts of fluids be taken throughout the day to dilute the urine and decrease the likelihood of bladder and kidney illnesses, as well as urinary tract infections, which are a killer of paraplegics and quadriplegics. Water fountains and coolers are not luxuries to disabled people.

If there are existing drinking fountains, a cup dispenser can be attached for use by those who cannot use the drinking fountain. This will work only if the fountain has a level area for cup placement and if the controls are easily operated. If those requirements cannot be met, the drinking fountain must meet the following criteria to be considered accessible:

- ☑ height of spout outlet above the floor: maximum of 36 inches
- ☑ controls up front (lever or easily pushed button)
- ☑ spout up front; water flow parallel to front of fountain
- ☑ operated by hand or foot and hand
- ☑ if located in recess (see illustrations)

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If there isn't an existing drinking fountain, it is not necessary to provide one solely for the use of the disabled.

If the existing drinking fountain meets all but the height requirements, it can be lowered for accessibility.

The best location for an accessible drinking fountain is near the accessible restroom. At a minimum, there should be the same number of accessible drinking fountains as there are accessible restrooms (one per male and female restroom).

It is not necessary to lower all drinking fountains in the building; a lower fountain can become a barrier to taller people with back trouble.

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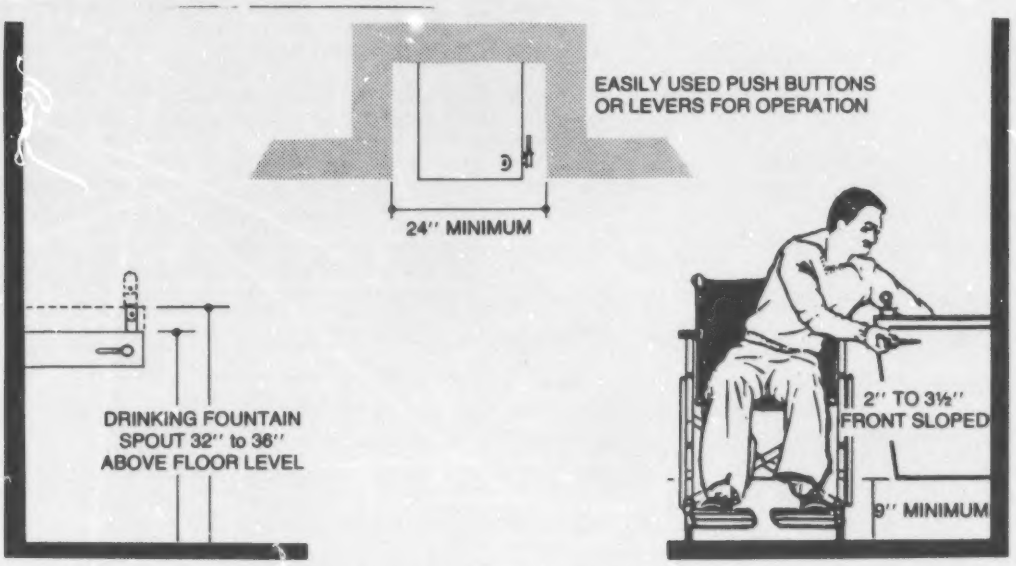
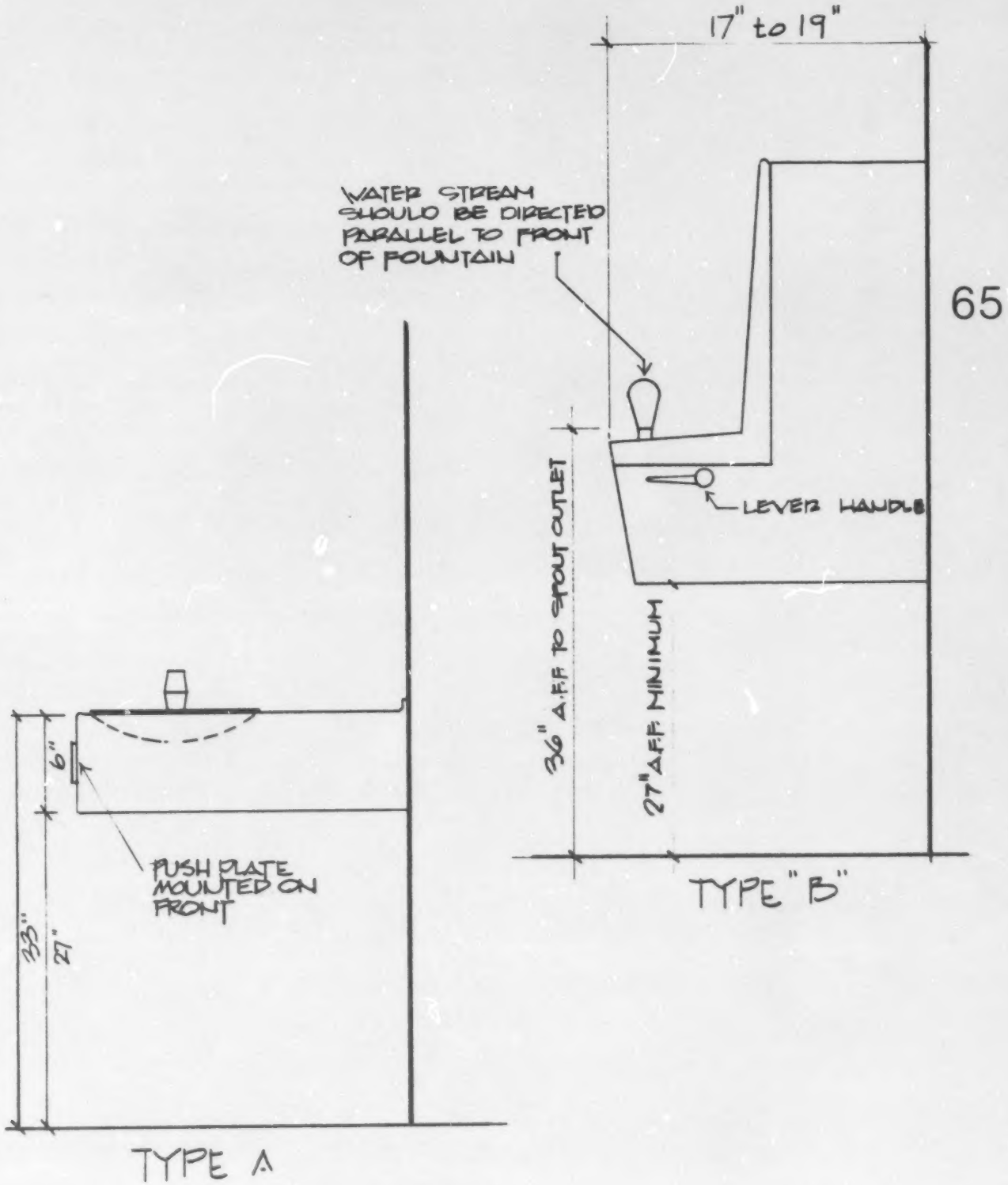
Accessible Drinking Fountain



Note: If front of fountain is not flush with or slightly projecting into corridor: then recess has to be larger 36" minimum.



65

WHEEL CHAIR WATER COOLERS
Scale: 1½" = 1'-0"

Construction Specifications

The following specifications are not all inclusive but represent those areas that should be included when writing specifications for drinking fountains.

Wheelchair Fountains

Height: The height of the top side of the basin edge shall be fixed at 29 inches (73.7 cm), providing a spout-top height of 32 inches (81.3 cm).

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Mounting: A drinking fountain shall be mounted to provide the drinking spout at least 12 inches (30.5 cm) from the rear wall, if fountain is back mounted. If the fountain is mounted within a recessed section of wall, the fountain shall be centered in the recess and still provide a spout-to-back wall distance of at least 12 inches (30.5 cm). The recess shall be a minimum of 5 feet (153 cm) in width. In either case, the spout shall be mounted as close as possible to the front edge of the fountain.

Water Controls: Blade-type handles, mounted horizontally on each side of the fountain, shall be set so that they are pointing toward the rear of the fountain. Protruding push buttons or push plates can also be used. These push operators shall be mounted on the front or side surfaces of the fountain.

Adjacent Space: When the fountain is not recessed, clear space of at least 3 inches (92 cm) on each side shall be provided to allow area for wheelchair maneuvering.

Chapter 7

SPECIAL SPACES

Although criteria for special spaces and facilities are not specified in the ANSI standard, basic concepts of movement and space requirements have been applied to these spaces that they too will be accessible. Special spaces are broken down in the following categories: areas of assembly, dormitory and kitchen spaces, dining halls and cafeterias, libraries, physical education facilities, and laboratories and classrooms.

Because these spaces and facilities are a major part of academic life, they might be required to meet "program accessibility" on the campus. It is important to remember, though, that not all spaces or facilities are required to meet campus program accessibility. If a particular room or area is required, it should meet minimum criteria under each section and general criteria set forth in the first part of this publication.

Areas of Assembly

Assembly areas (performing arts, spectator areas in physical education facilities, lecture halls, auditoriums, etc.) should have spaces for handicapped people using wheelchairs.

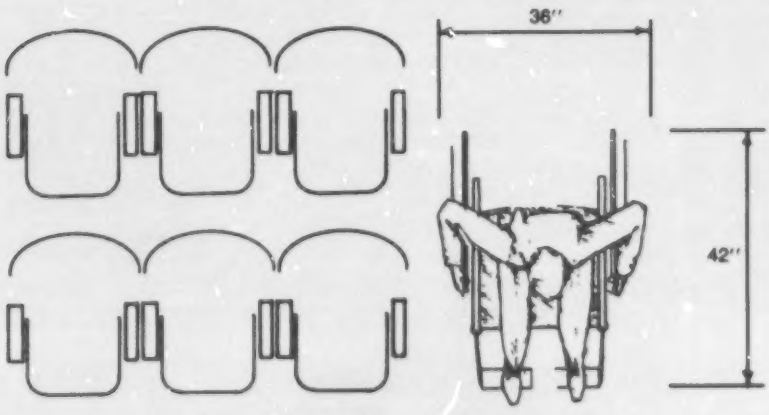
Capacity of assembly space	Minimum number of seating spaces for wheelchairs
0-75	2 spaces
75-300	3 spaces
over 300	3+1 for each additional 100

The above chart indicates minimum provisions. If the campus has an existing population need for a higher amount of space, then use that number when programming the space.

Any assembly area that is to be considered accessible should meet the following minimum criteria:

- ☑ the door(s) to the assembly space must meet minimum criteria of doors (Chapter 3)
- ☑ minimum number of seating spaces meets above capacity requirements

Accessible Cross Aisle Wheelchair Seating



Note: The location of positions for people in wheelchairs must be on level floor.

- ☑ space size minimum 36 inches by 48 inches
- ☑ the areas set aside for wheelchairs should not block ingress and egress of others
- ☑ seating area must be level

Dormitory and Kitchen Spaces

Sleep/study areas are very important places for students as they spend a great deal of time there. It is important that this area be especially well-planned for the disabled student. Regulation 504 states that the disabled student should be afforded the same opportunities for housing that other students are given. This does not mean that every residence hall room be accessible; but a reasonable selection of living arrangements must be available to the handicapped student. It is also important that a "ghetto" not be created in one hall, but rather that a varied selection of housing be provided. This can be accomplished in phases as the student population increases. In considering the choice of housing, be careful that a mobility handicapped student is not assigned a room that requires traveling long distances to classrooms and other campus facilities, or space that necessitates crossing hazardous areas of vehicular traffic, railroad tracks, or areas of freight delivery.

A campus need not lose beds when a double room is made accessible. If the modified room does not allow for two single beds, a bunk bed arrangement can be used, with the disabled student assigned the lower bunk.

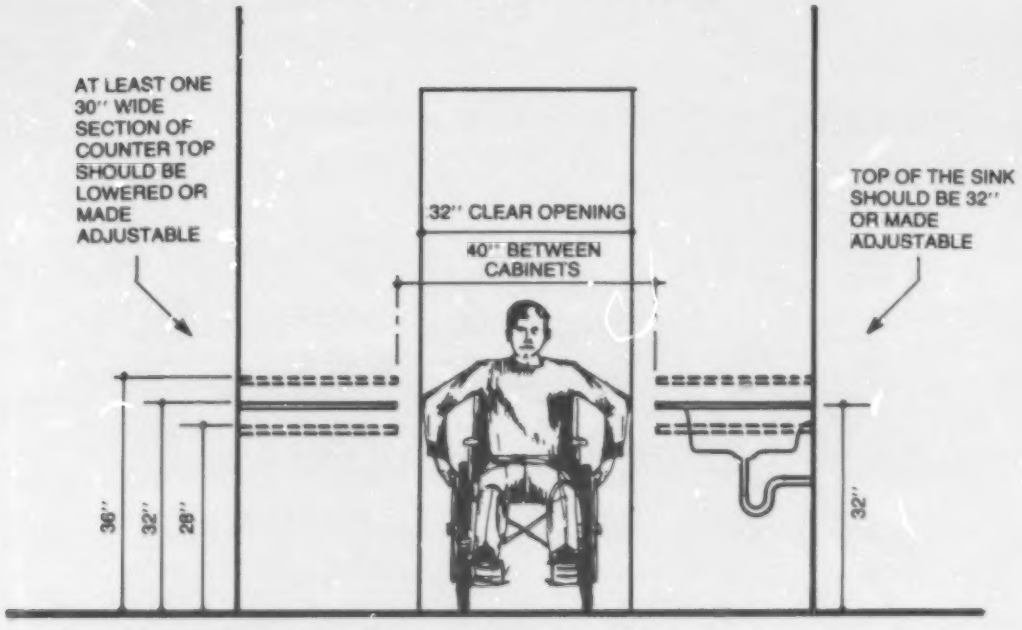
The minimum number of beds that should be made accessible is based on the peak need experienced over the last few years and/or at least two bedrooms in the following types of living styles: male, female, and coed (if available to able-bodied students).

Note: *The above minimum requirements as to the number of beds does not mean that if a campus meets this minimum it can turn away a handicapped student because there isn't an accessible bedroom. The campus will have to make additional space accessible as it is needed.*

The following criteria shall be applied to those residence hall suites or apartment spaces chosen:

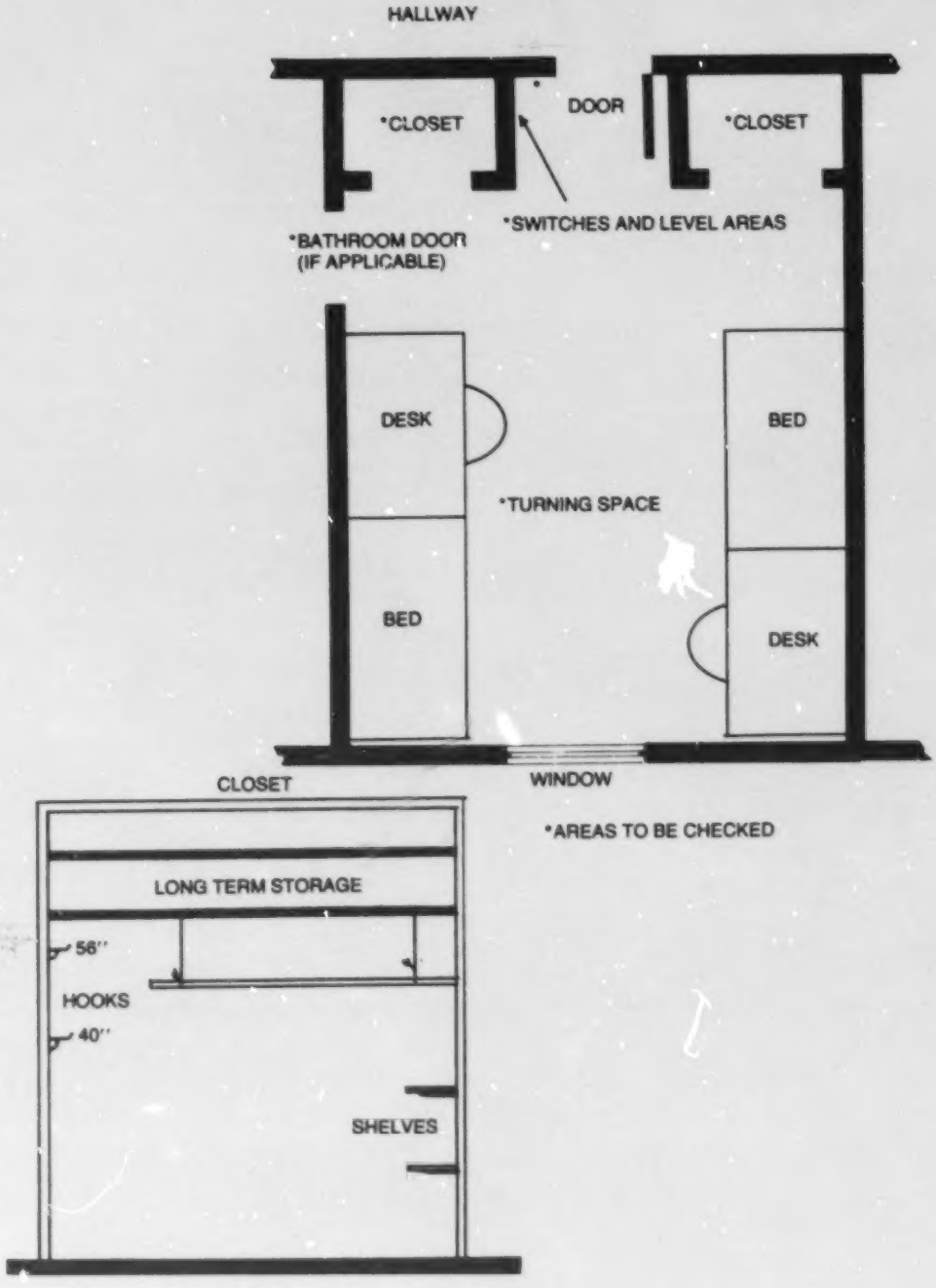
- ☑ entrance door has at least a 32 inch clear opening with proper hardware and space adjacent to handle
- ☑ a clear space of at least 5 feet by 5 feet somewhere in the room for maneuvering or turning
- ☑ an accessible closet

Accessible Kitchen Dimensions


AT LEAST ONE 30" WIDE SECTION OF COUNTER TOP SHOULD BE LOWERED OR MADE ADJUSTABLE
32" CLEAR OPENING
40" BETWEEN CABINETS
TOP OF THE SINK SHOULD BE 32" OR MADE ADJUSTABLE
36"
32"
28"
32"

Accessible Sleep/Study Area

Sleep Room
(NO SCALE)



- ☑ accessible restroom available
- ☑ doors in the room leading to bathrooms or other spaces meet minimum door criteria
- ☑ light switches and controls within accessible reach

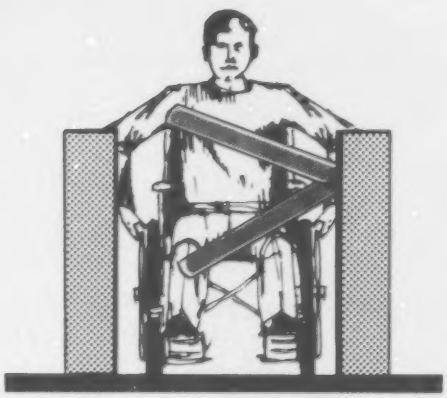
Kitchens: As "program accessibility" might include apartment type living, the following basic information is provided on kitchen design for the disabled. As many people, able-bodied and disabled, will be using these facilities over a period of time, consider making the 30-inch counter height for work surfaces and sink adjustable. This will allow for adaptability so that these areas may serve everyone who uses them.

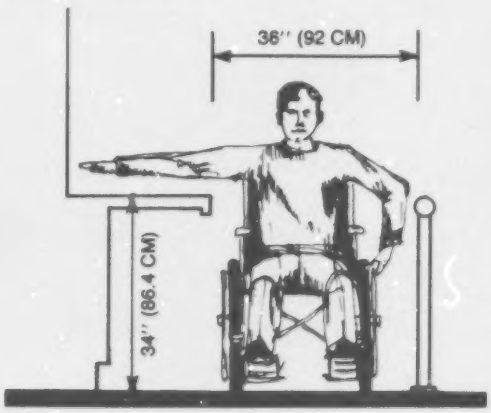
The following criteria must be met:

- ☑ doors or entrance ways to the kitchen provide a minimum 32 inch clear opening
- ☑ clearance between all opposing base cabinets, walls, appliances, etc., of at least 40 inches
- ☑ at least one 30 inch wide section of counter top shall be lowered to 32 inches above the floor (preferably this is adjustable from 28 to 36 inches)
- ☑ top of the sink set at a height of 32 inches (may be adjustable from 28 to 36 inches). Faucets, drain protection, and reach meet requirements indicated under lavatories, pages 43-44.
- ☑ cabinet storage from 9 to 48 inches available
- ☑ accessible refrigerator door storage area. (Side by side refrigerator/freezers make both areas accessible.)
- ☑ location of controls on ovens and ranges shall not require reaching across burners

Dining Halls and Cafeterias: The first consideration should be the entrance to these facilities. As many colleges have controlled access (turnstyle), it is important that alternate equal access is provided to the disabled student. This might mean that the

Dining Hall Entrance Must Be Accessible





I NO TURNSTYLES

turnstyle will have to be removed or the student be allowed to use another entrance. It does not meet the intent of Section 504 to require a disabled student to pass through a high hazard area such as a kitchen to gain access to the dining hall.

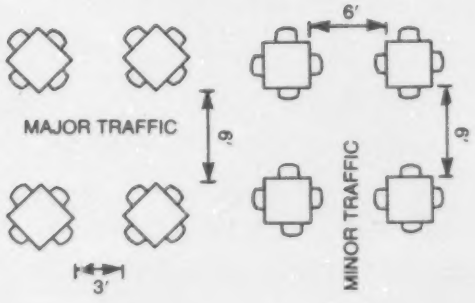
As the campus can provide a disabled student with table service, the counter does not necessarily have to be accessible. The tables shall be arranged so that there is access in and out of the dining hall for the wheelchair; this is something that can be arranged easily by the campus. At least several tables shall be designed (as shown) to accommodate a person seated in a wheelchair. The following criteria must be met:

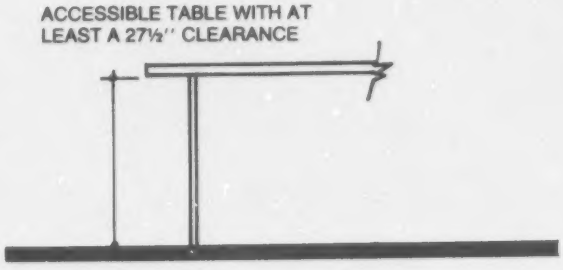
- ☑ an accessible entrance that meets all door criteria
- ☑ counter (if cafeteria style) is accessible or there is table service
- ☑ accessible tables and paths of travel within the cafeteria or dining hall

Libraries: It would be unreasonable to assume that all books and publication resources of the library can be put within the reach of a disabled person using a wheelchair. In light of this, it is assumed that library personnel will be responsible for much of the program accessibility required in this building type. The most important criteria are as follows:

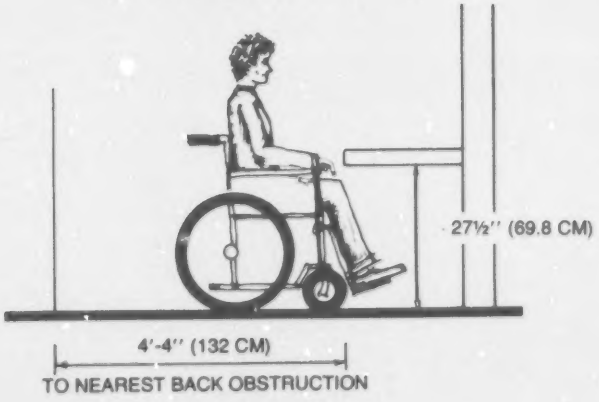
- ☑ entrance to the library must not be through a turnstyle or other device restricting entry by a disabled person
- ☑ equipment and general use facilities (e.g., microfilm readers, tape recorders, etc.) on an accessible level of the library and at least one of each type of equipment is designed or positioned for accessibility
- ☑ if study carrels are provided, at least one should be accessible (more if the current or projected handicapped student population warrants)

Accessible Table Areas





Accessible Study Carrel



Physical Education Facilities: Physically handicapped individuals, especially those in wheelchairs, frequently do not get adequate amounts of exercise in normal daily activities. Therefore, it is particularly important that certain physical education programs and facilities be made available. These are the swimming pool, exercise areas, gym, and locker rooms and showers.

As a disabled student will both participate in and view activities that take place in this building, it is important that access is provided for both these functions. The criteria checklist should include:

- ☑ access to pool from locker rooms and spectator areas
- ☑ access to exercise area from locker room
- ☑ accessible restrooms (both public and locker areas including shower)
- ☑ access to exterior physical education facilities from locker rooms

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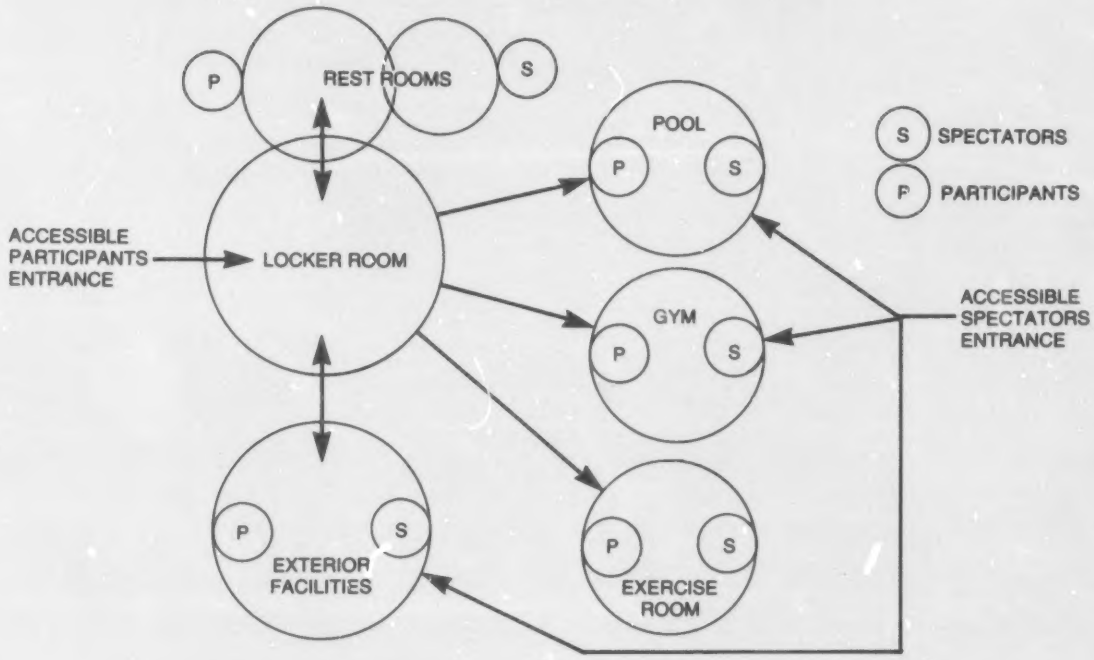
Required Areas and Paths of Travel To Be Accessible



☑ access to gym from the locker room and spectator areas

Laboratories: Because of the many ways that a campus can provide "program accessibility" to a disabled student (e.g., student partners, modifying lab stations, etc.), when surveying a laboratory concentrate on how a disabled student would get into and around the laboratory. Then identify at least one area in the lab that has enough level floor space so that a person using a wheelchair can maneuver to an existing lab station (which can be lowered and modified if necessary), or an area where a mobile laboratory may be used. The following criteria should be taken into consideration:

☑ laboratory is located on accessible level

☑ any local or state codes should be considered if they affect the physical layout of the lab

☑ entrance door meets minimum clear opening criteria of 32 inches

☑ emergency facilities are accessible (e.g., eye wash or shower station)

☑ student in a wheelchair can get to all apparatus in the lab, although all items might not be within reach

☑ level area within the lab or at an existing station that could be modified to meet the requirements of a disabled student

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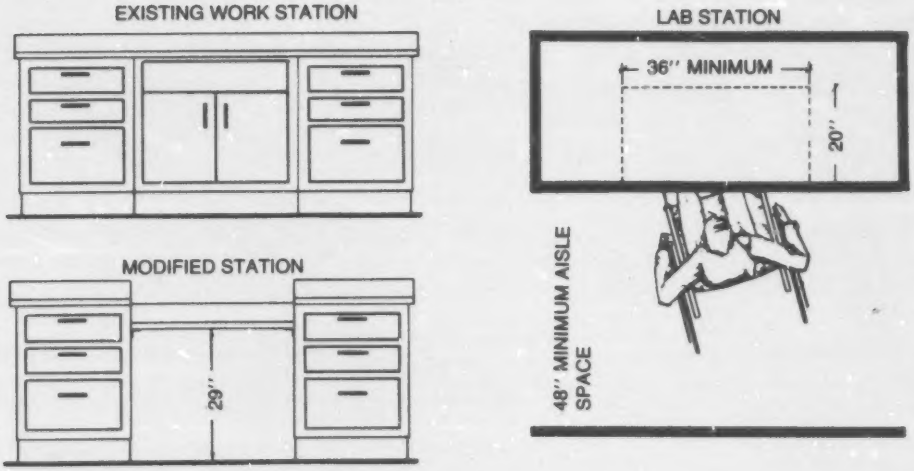
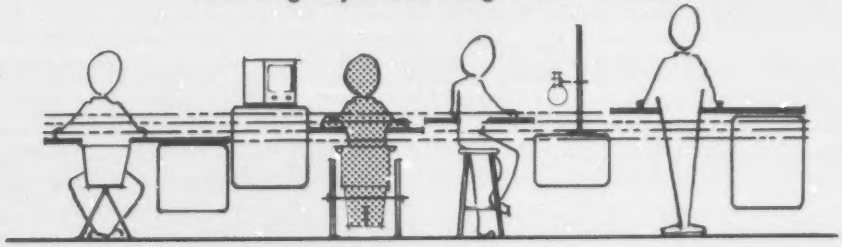
Laboratory Mobility



Rail-hung Adjustable-Height Work Stations



Signage

It is important to have signage in those areas where there are duplicate building functions that might not be accessible. For example, if only one entrance out of four in a building is accessible, the accessible entrance shall be signed with the International Symbol of Access. The same is true for restrooms. It would not be necessary, though, to sign each and every accessible space in the building.

In an elevator signage is important to a sight-disabled individual in two spaces. First, there should be raised or engraved numerals to the left of each button. On the door jamb, raised numerals indicating floor level should be placed 5 feet above the hall floor. (See Elevator Specification, page 36.)

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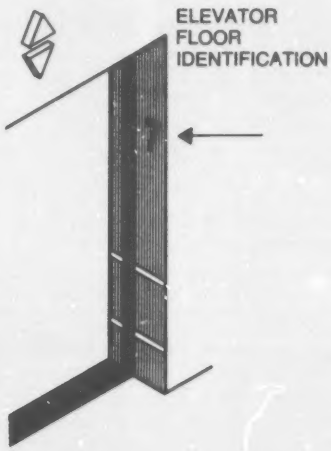
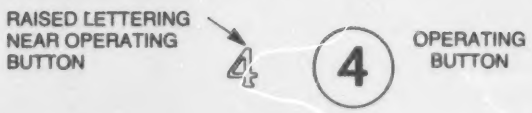
Signage

INTERNATIONAL SYMBOL OF ACCESS

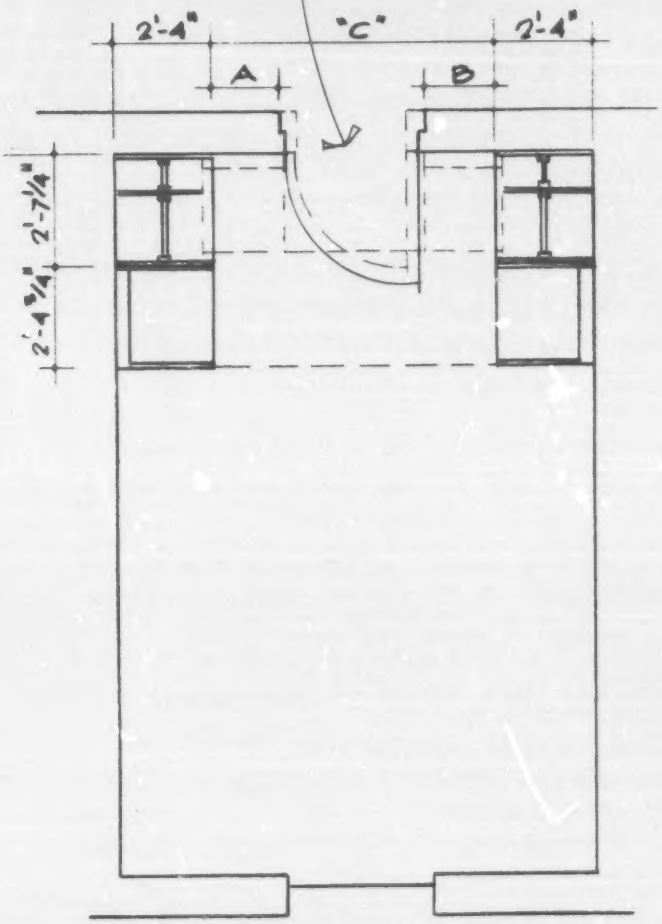




SPACE 'A' SHOULD BE A MIN. OF 24" IF 'C' IS 7'-0" OR GREATER MAKE 'A' & 'B' EQUAL

REMOVE EXIST'G & INSTALL NEW 36" DOOR FRAME PATCH AS REQUIRED & PAINT

NOTE: IF MAIL ROOM IS NOT ACCESSIBLE - PROVIDE MAIL SLOT W/ INTERIOR BASKET @ NEW CORRIDOR DOORS



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REMOVE EXIST. DRAWER / CLOSET UNITS AND SOFFITS, SEE ELEV. FOR NEW WORK.

PATCH AS REQUIRED

LIGHT SWITCHES MAX 42" A.F.F. OUTLETS NO LOWER THAN 18" A.F.F

TYPICAL SLEEP STUDY ROOM "A"
TWO-PERSON
Scale: ¼'' = 1'-0''

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

ENTIRE WARDROBE UNIT INCLUDING DRESSER TO BE 3/4" BIRCH VENEER PLYWOOD W/ CONT. 3/4" x 1/2" BIRCH OR POPLAR EDGING ALL EXPOSED EDGES, MISC. TRIM & BLOCKING TO BE BIRCH OR POPLAR. ENTIRE UNIT TO BE PAINTED.

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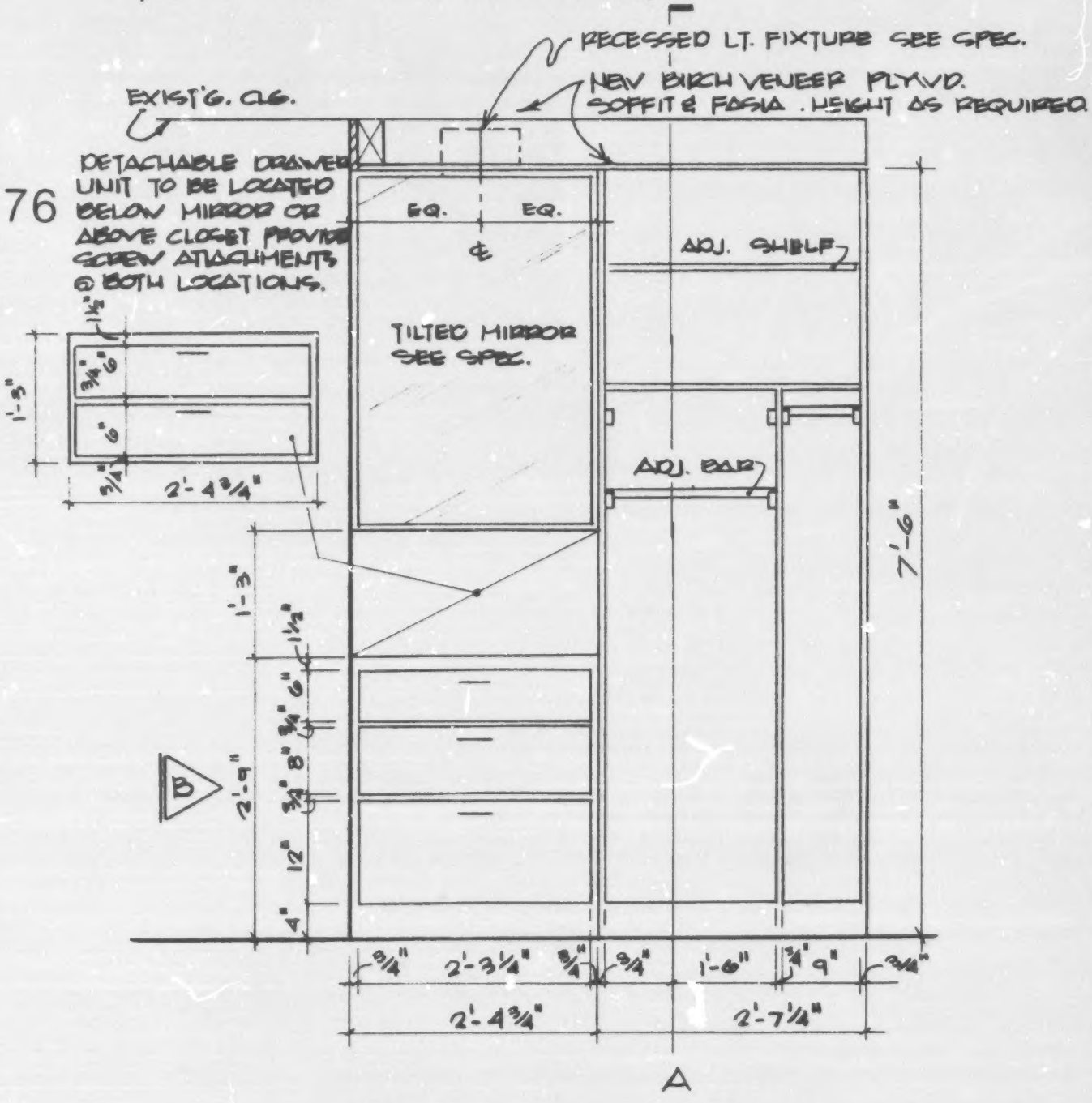
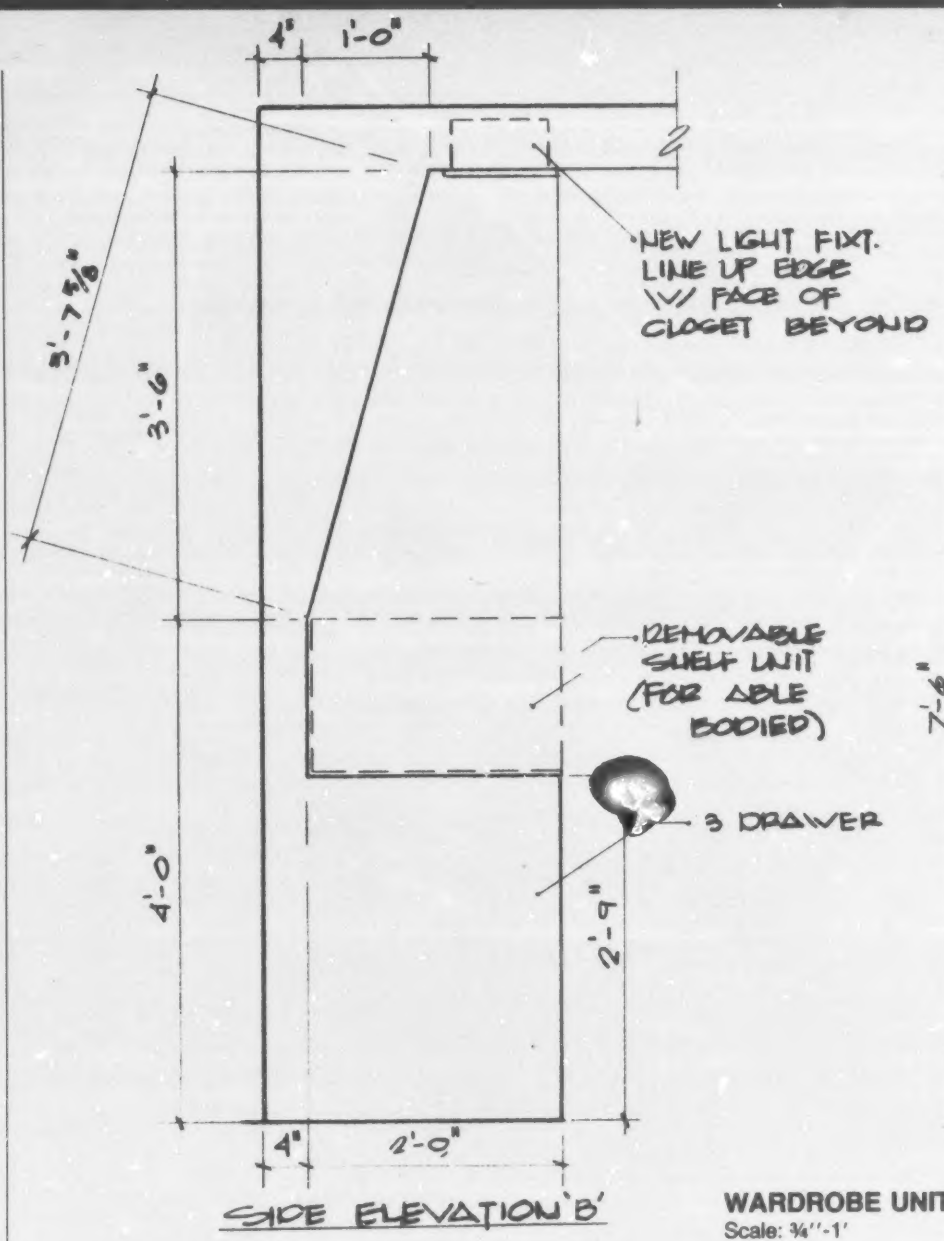
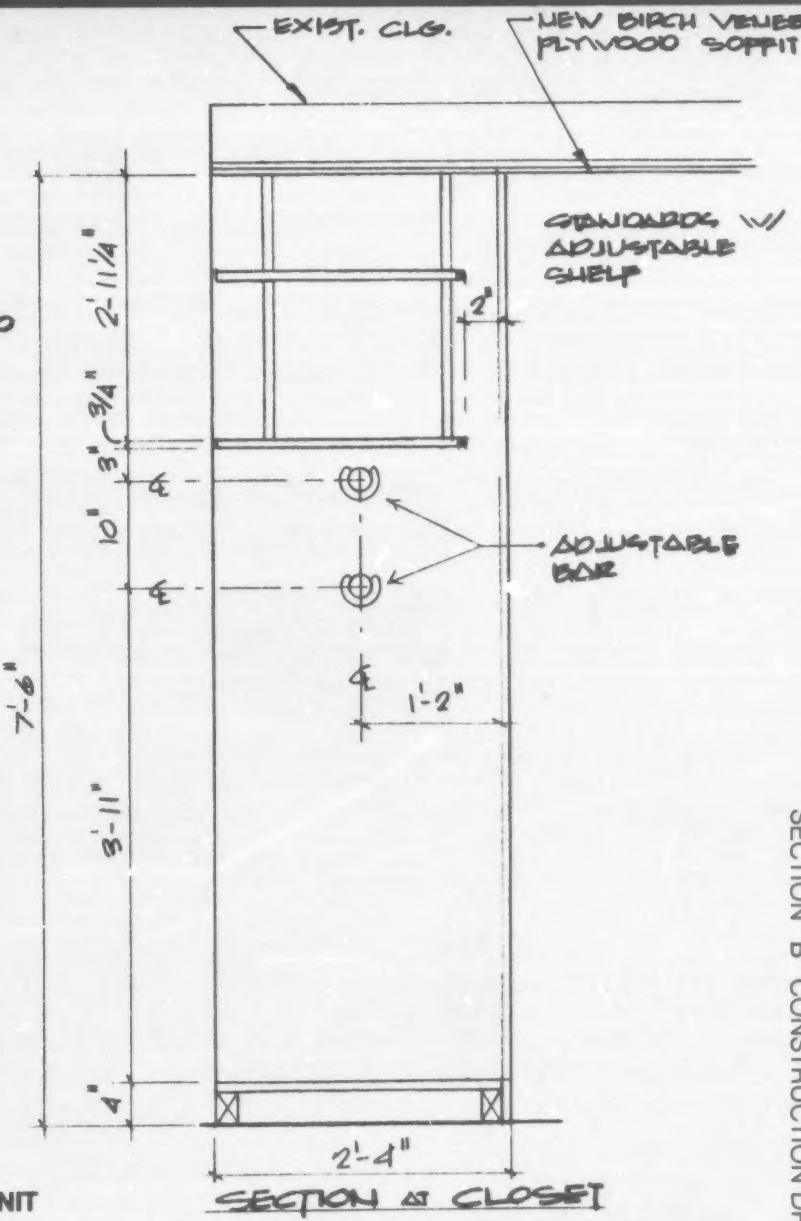


CLOSET ELEVATION
Scale: ¾"-1'

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



SIDE ELEVATION 'B'



SECTION @ CLOSET

WARDROBE UNIT
Scale: 3/4"-1'

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

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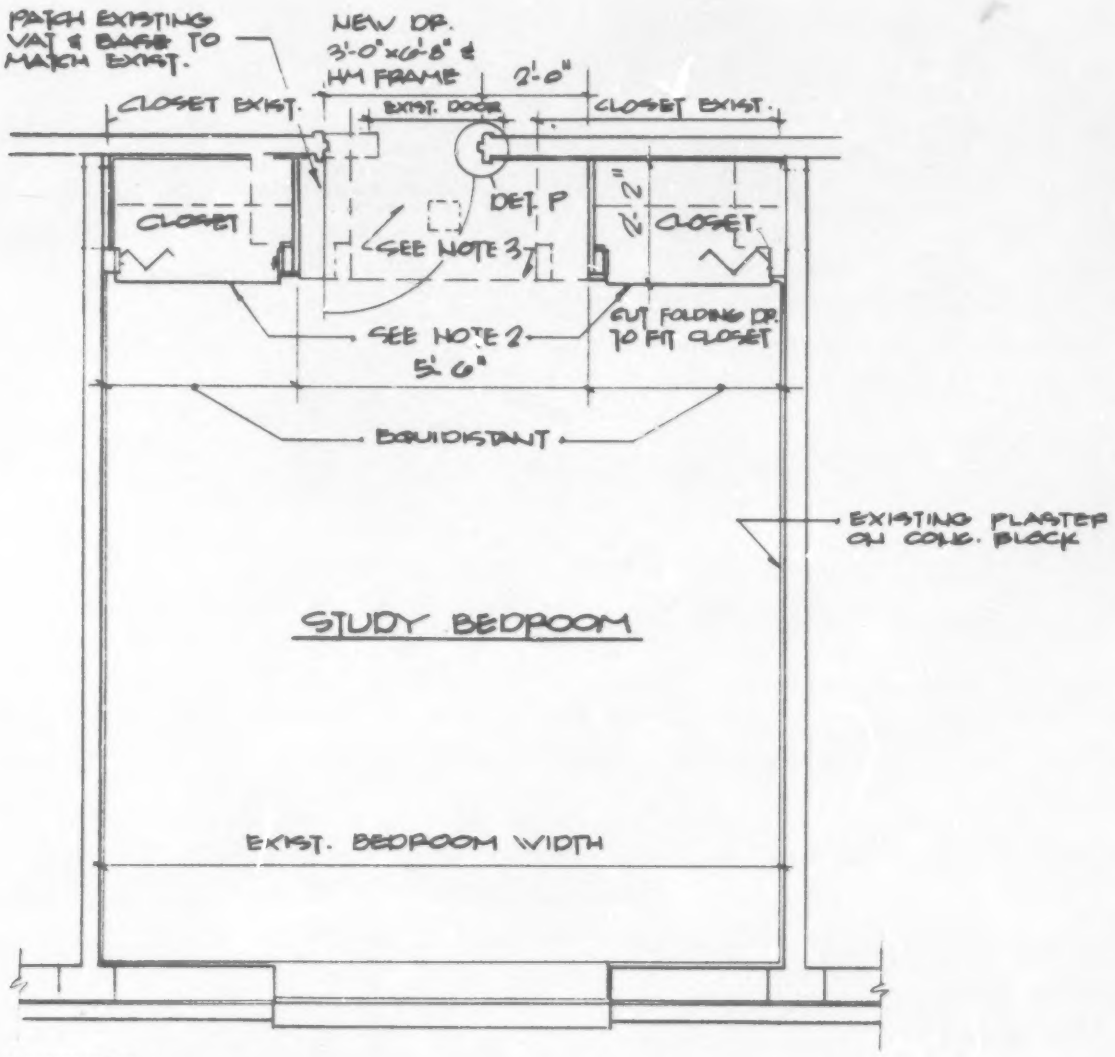
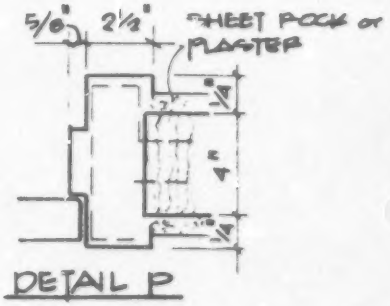


NOTES:

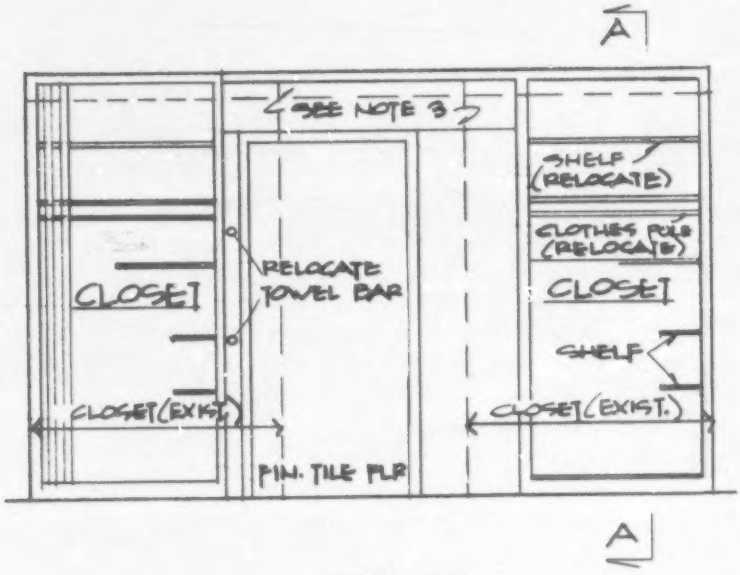
1. REMOVE EXISTING DOOR & HM FRAME, CUT OPENING IN EXISTING BLOCK WALL FOR NEW 3'-0" x 6'-8" DOOR & HM FRAME. PATCH EXISTING CONSTRUCTION.
2. REVISE CLOTHES CLOSET. REMOVE OUTSIDE JAMB OF CLOSET & REBUILD AS INDICATED, CLOSET JAMB AT WALL TO REMAIN UNDISTURBED.
   CUT & ALTER EXISTING MATERIAL & PROVIDE NEW MATCHING MATERIAL AS REQUIRED, PATCH EXISTING FINISHES.
3. PROVIDE NEW PLYWOOD SOFFIT & LIGHT



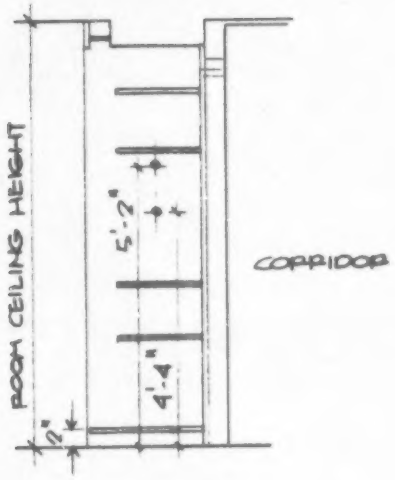
DETAIL P

ALTERNATE SOLUTION TWO-PERSON BEDROOM
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

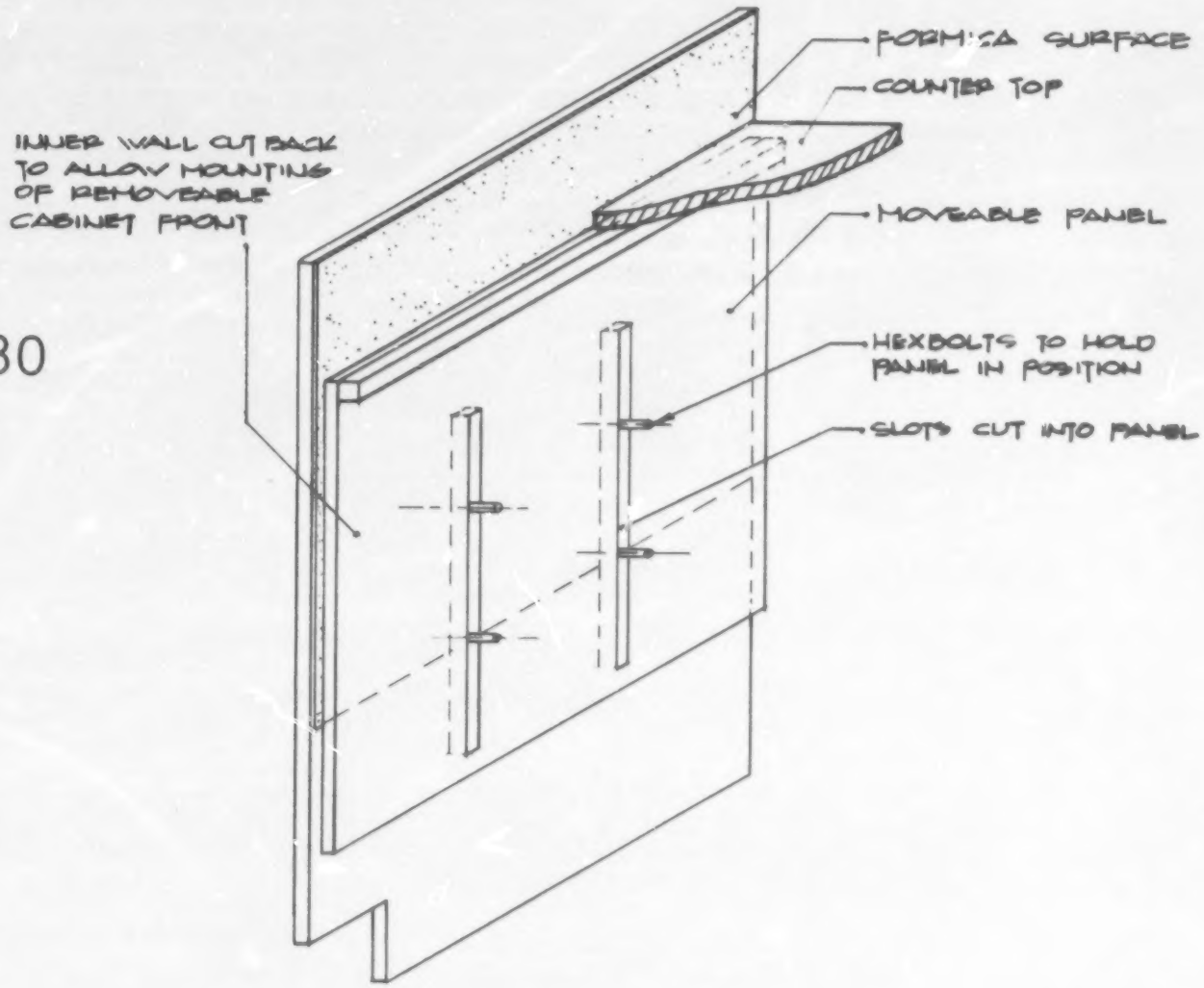


ELEVATION C
Not to scale



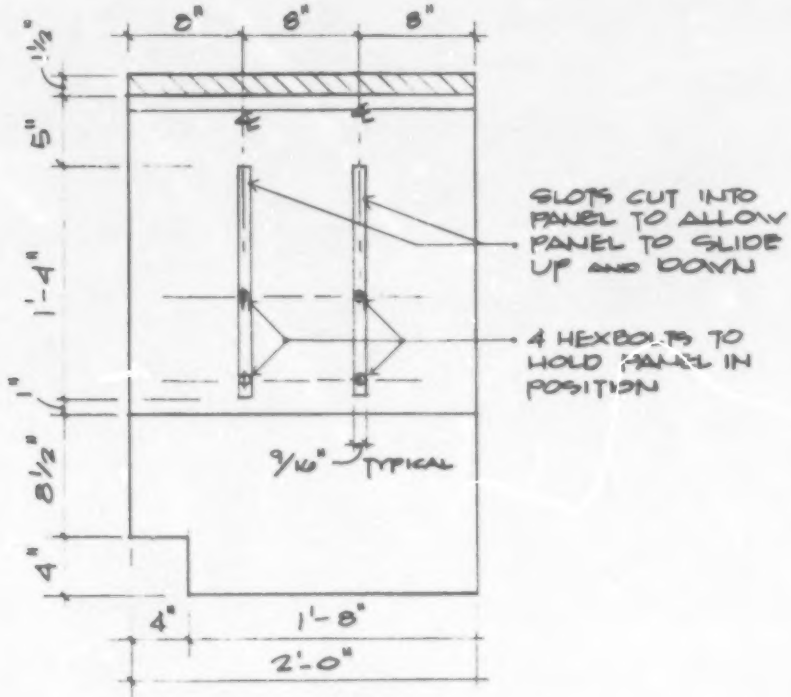
SECTION A-A

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.


FORMICA SURFACE
COUNTER TOP
INNER WALL CUT BACK TO ALLOW MOUNTING OF REMOVEABLE CABINET FRONT
MOVEABLE PANEL
80
HEXBOLTS TO HOLD PANEL IN POSITION
SLOTS CUT INTO PANEL

ISOMETRIC VIEW OF INSIDE WALL OF ADJUSTABLE KITCHEN CABINET
Not to scale

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.



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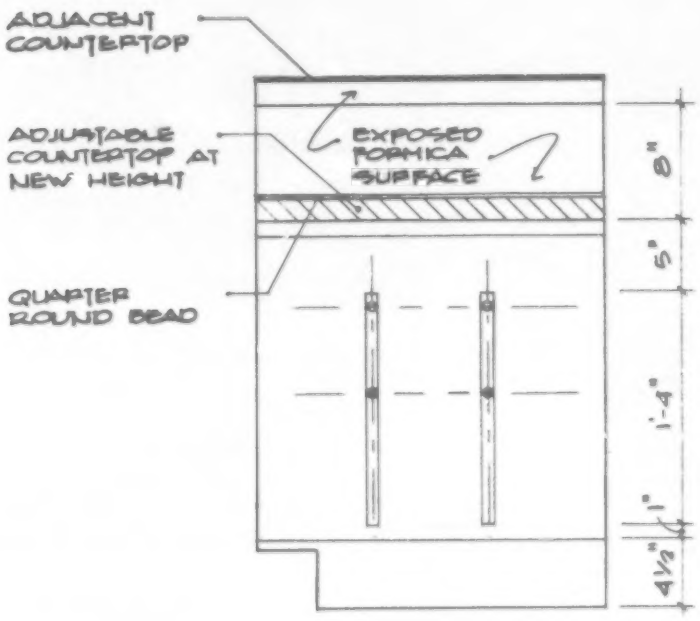
INSIDE VIEW WITH PANEL IN UP POSITION
Scale: 1" = 1'-0"



PANEL IN FULL DOWN POSITION
Scale: 1" = 1'-0"

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

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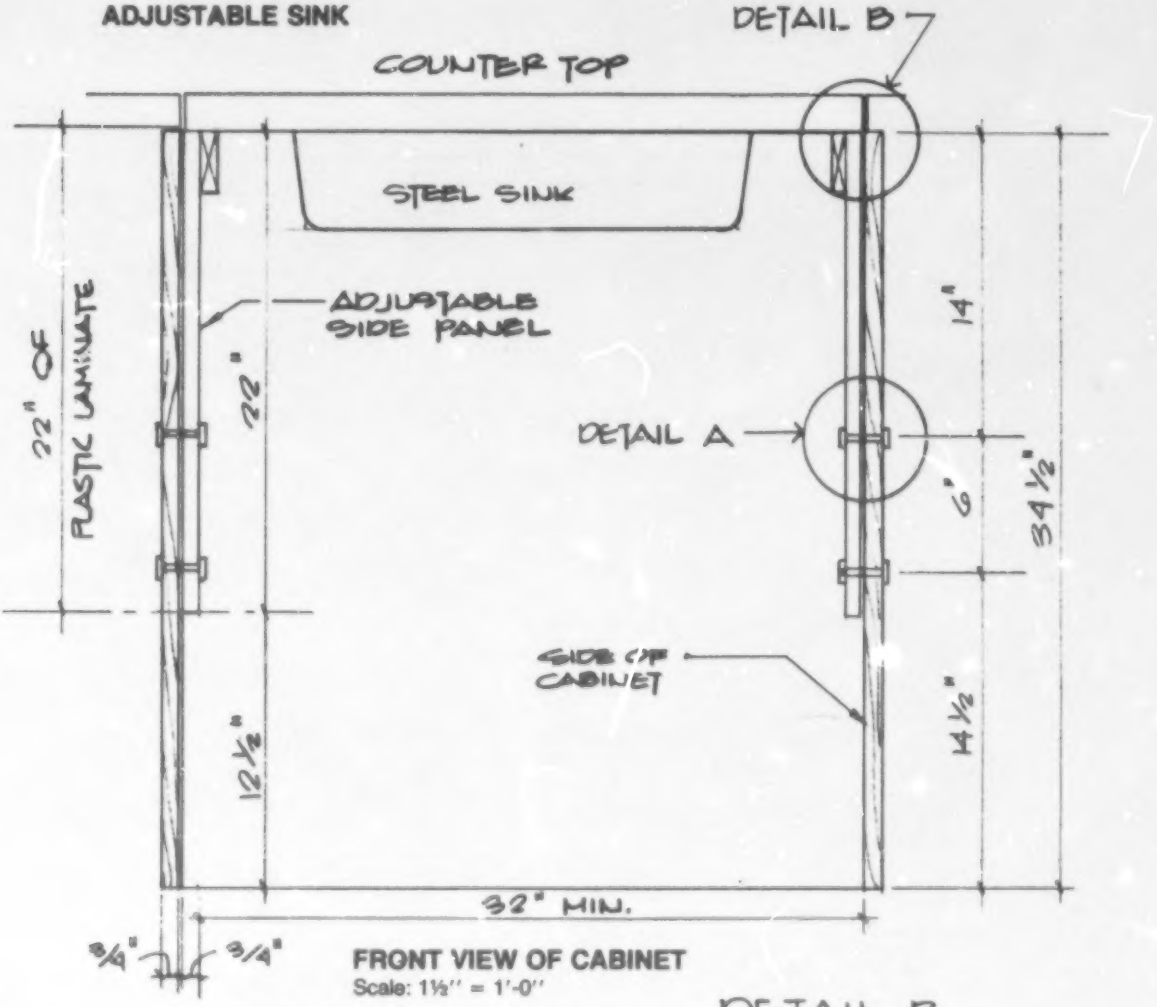
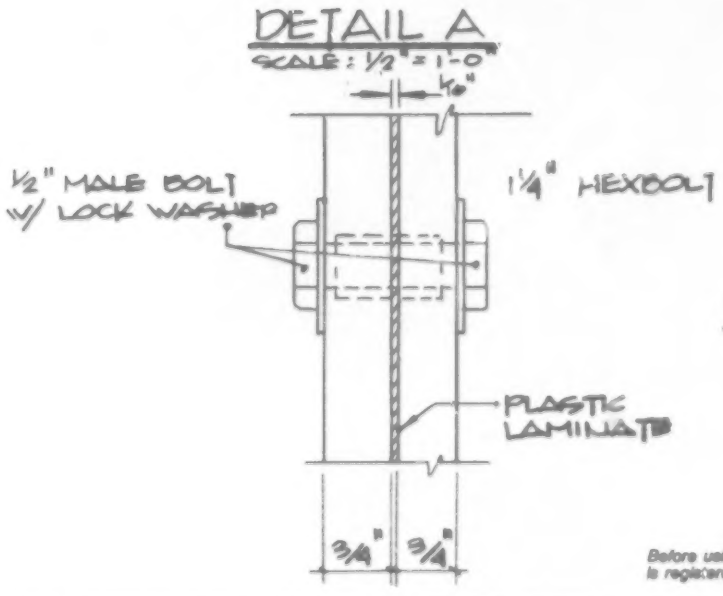
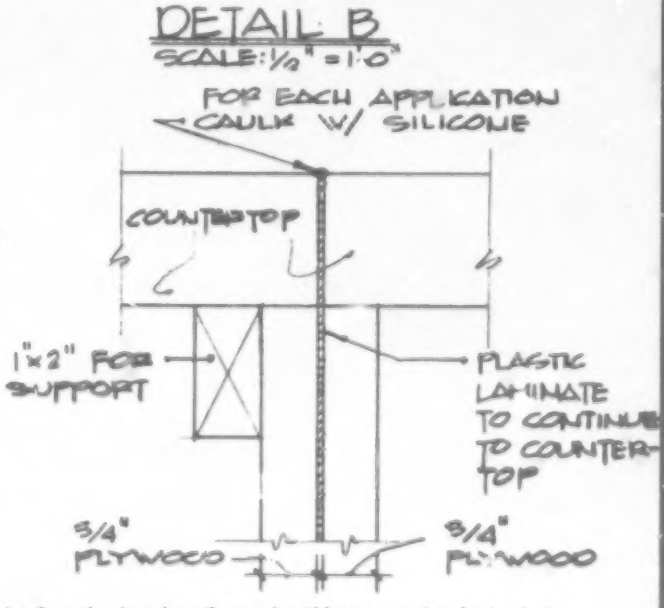
ADJUSTABLE SINK



FRONT VIEW OF CABINET
Scale: 1½" = 1'-0"





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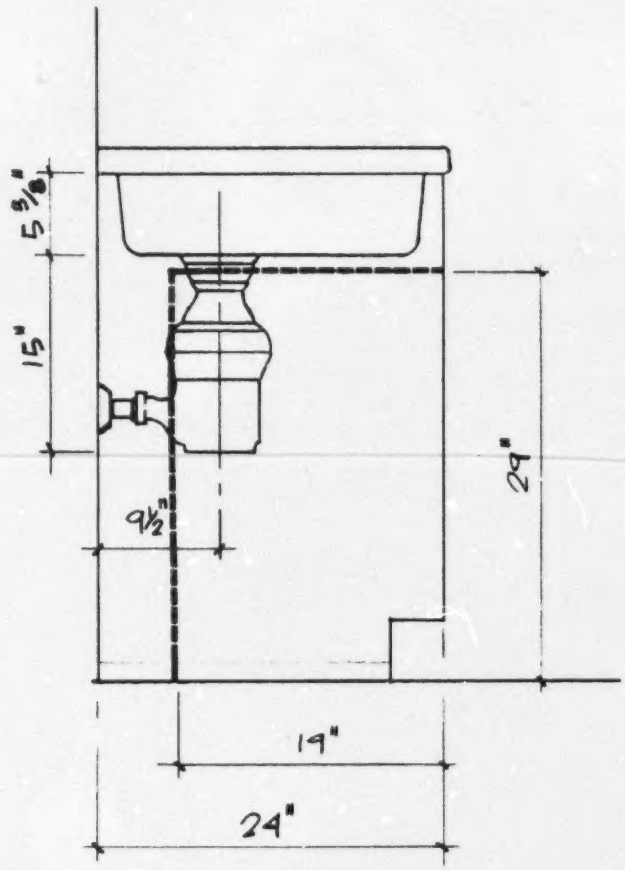

DETAILS ON PLUMBING AT SINK

A.) TRAP & SUPPLY LINES SHALL BE INSTALLED AT LEVEL TO ALLOW COUNTERTOP TO BE MOUNTED AT 28 INCH HEIGHT.

B) TRAP SHALL BE PULLED BACK PARALLEL TO WALL TO AVOID CONTACT WITH WHEELCHAIR USERS.

C.) ADJUSTABILITY WILL BE SUPPLIED BY INSTALLING A 4" OR 8" EXTENSION AT INSIDE OF SINK.

D.) SUPPLY LINES SHALL BE MOUNTED TO FIT SINK AT 28" HT., W/ FLEXIBLE HOSES TO ALLOW FOR 8" ADJUSTMENT.

E.) THE SINK SHALL BE INSTALLED IN THE CENTER OF THE COUNTERTOP, W/ THE TRAP TURNED IN THE DIRECTION THAT THE DRAIN IS OFFSET. (IN THIS CASE, LEFT.)

F.) THE DISPOSER, IF INSTALLED, WILL BE POSITIONED IN ADJACENT CABINET WITH SHALLOW BAR SINK. WASTE SHOULD TAP INTO WASTE LINE OF MAIN SINK.

CLEARANCES OF DISPOSAL AT SINK

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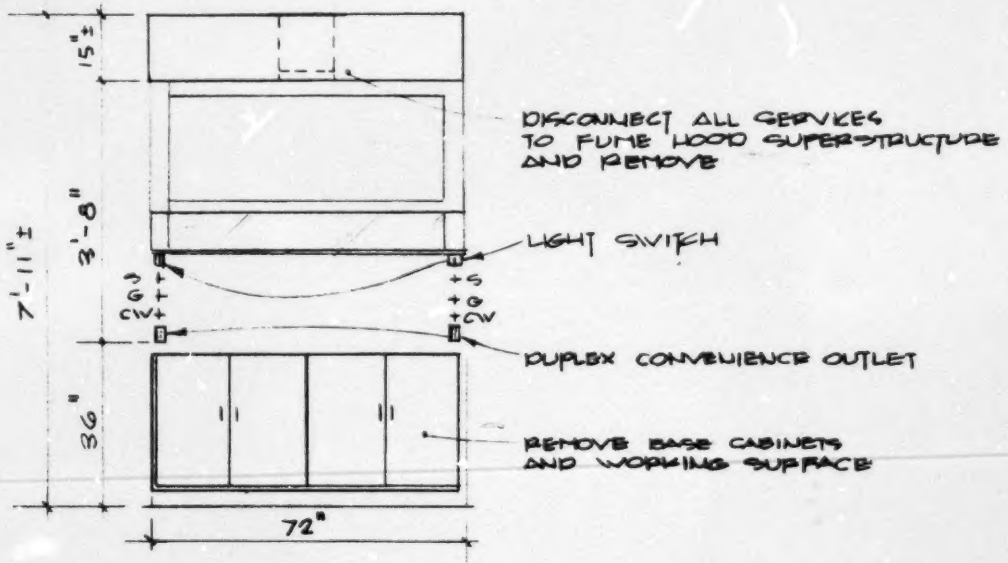
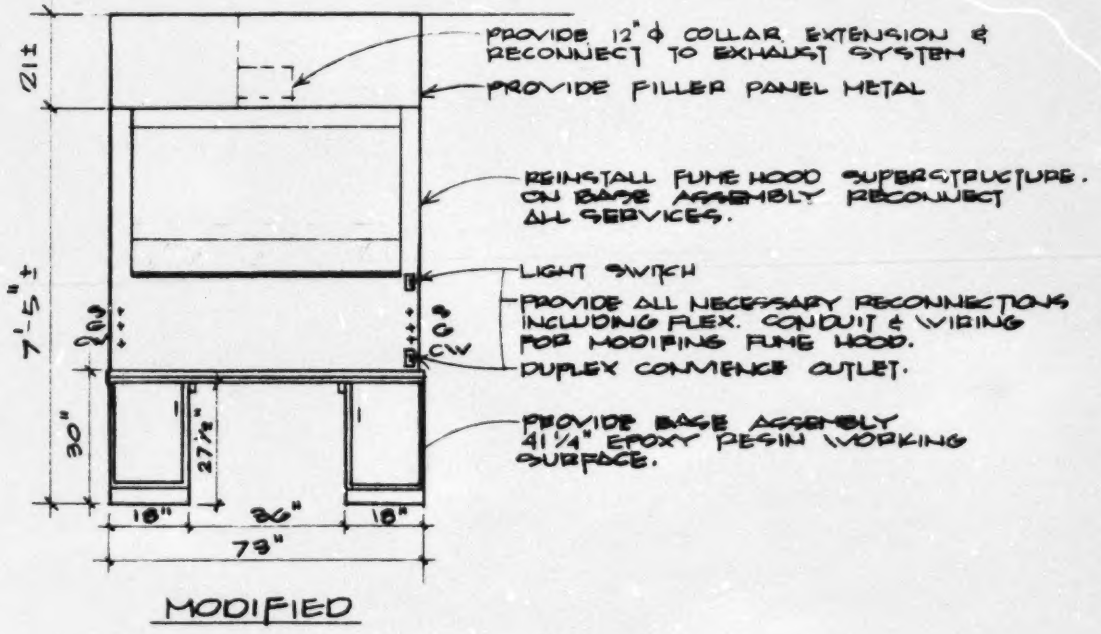


MODIFICATION OF FUME HOOD
Scale: ½'' = 1'-0''



MODIFICATION OF FUME HOOD
Scale: ½'' = 1'-0''

Before using these drawings, have them reviewed by a licensed professional who is registered by your state to assure that all local and state building codes are met.

Construction Specifications
Portable Science Stations (Multi-Use)

General Requirements: Stations shall be prewired and preplumbed in factory.

All mechanical/electrical service fixtures and fittings shown or called for, to be mounted on or in conjunction with portable stations and equipment, shall be supplied complete.

Portable science stations shall be designed to provide a convenient, barrier-free work station for students confined to wheelchairs.

Unit shall be self-contained and portable to facilitate storage or relocation as required by curriculum requirements. Each unit shall be double-sided, one side for use in biology lab work, the other side for chemistry or physics lab activities. Controls for cold water, air, and vacuum services shall be conveniently located on both sides of table, as well as 110V duplex electrical receptacles.

Portable science stations shall meet needs of physically handicapped persons confined to a wheelchair with regard to knee clearance, forward and side reach, countertop height, location of services and controls, and microscope shelf location.

Stations shall be 60 inches wide by 30 inches deep by 32 inches high, ±½ inch.

Standard Features: Countertops shall be one-piece chemical resistant black fiberglass top with built-in raised edge on all four sides to retain spillage. Tops shall be further recessed at area of integrally molded sink. Built-in burette sockets shall allow use of optional apparatus rods.

Service cabinets shall be equipped with double doors to provide easy access to mechanical and electrical systems which shall be prewired and preplumbed.

Biology cabinets shall consist of a pull-out shelf and a pull-out cupboard for storage of materials.

Cupboards shall be mounted on mechanical slides for smooth opening and closing with stops provided to prevent accidental removal. A removable tote-tray shall be included and located within cupboards.

Chemistry-physics cabinets shall consist of a pull-out shelf, a 4-inch deep drawer, and a 12-inch deep pull-out cupboard for storage. Drawers and cupboards shall be mounted on full extension mechanical slides with stops provided to prevent accidental removal.

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Water system shall consist of a two-gallon pressurized supply container, a 2½ gallon waste container, a 1½ hp pressure supply pump with pressure regulating switch, and a gooseneck faucet with a serrated tip. Water flow shall be activated by push-button controlled solenoid valve.

Electrical systems shall be completely prewired and protected by a ground fault interrupter including a control panel on each side of table apron with control switches for water and for optional air and vacuum systems. Duplex 110 V receptacles shall be located on each side of the table apron. Entire system shall be energized by a 10-foot electrical cord fitted with a standard grounding three-prong plug for connection to building service outlet.

Note: *The above specification is for the basic unit only. Specific equipment for special use (chemistry, biology, etc.) will have to be included in the overall specification for this piece of equipment.*

Emergency Shower Unit and Eye Wash Stations: The existing emergency shower units and eye wash stations shall be changed to accommodate the handicapped in accordance with applicable codes. Extend and reroute the chain of the emergency shower to the level and area for ready operation by the handicapped, if required, and provide with blade handles, if required.

The existing eye wash stations shall be changed to the elevation required to accommodate the handicapped.

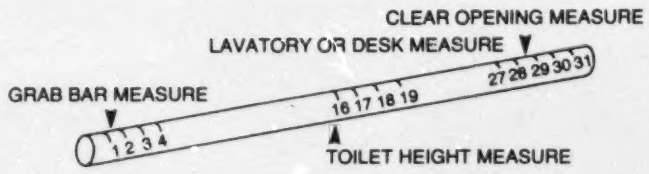
Appendix

Useful Tools for Survey

Clear Opening Measure: Items needed: a ¾ inch diameter wood dowel cut to 32 inches; 12 inch long straight edge; and felt tip, thin line pen.

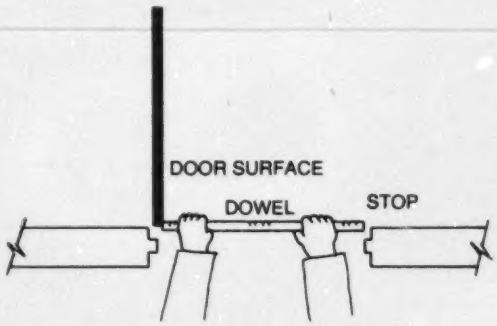
Cut the dowel to 32 inches in length. Make the following markings with the felt tip pen on the dowel. Starting at one end: 1", 1½", 2", 3", 4", skip to 16", 17", 18", 19", 20", skip to 27", 28", 29", 30", 31", 32". You now have a useful tool to measure the clear width of a door opening, the height of a toilet seat, the distance of a grab bar from its supporting wall, or the height from the floor to the underside of a desk, lavatory, or work table.

Measuring Tool



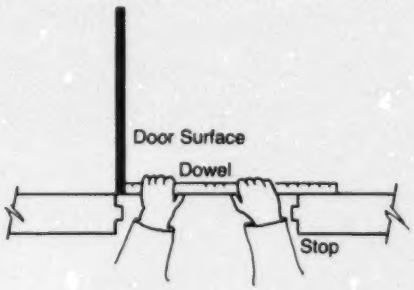
To measure the clear opening of a door, the dowel should be placed horizontally in the opening with the door opened to 90° (see below). Panic opening devices should not interfere with this clear opening measure, unless the device projects below 32 inches.

Measuring Clear Opening of a Door



If the dowel fits through the clear opening, the door meets the minimum requirements. If the dowel does not fit (refer to below), you can measure the clear opening by putting the 0" end of the dowel at the door surface with the other end as close as possible to the door stop and jamb (see below). The dimension from the door face to the stop can be read by placing a straight edge as shown.

Measuring Clear Opening if Dowel Does Not Fit



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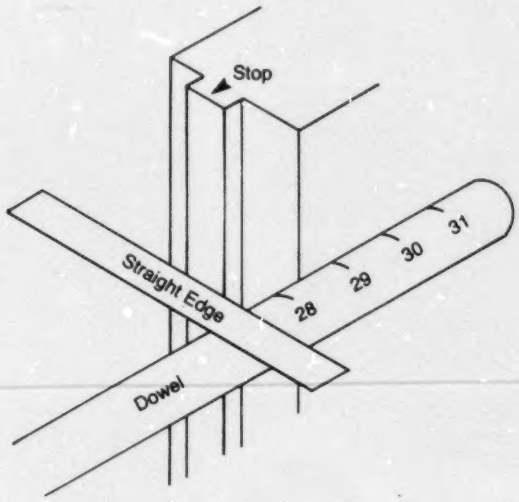
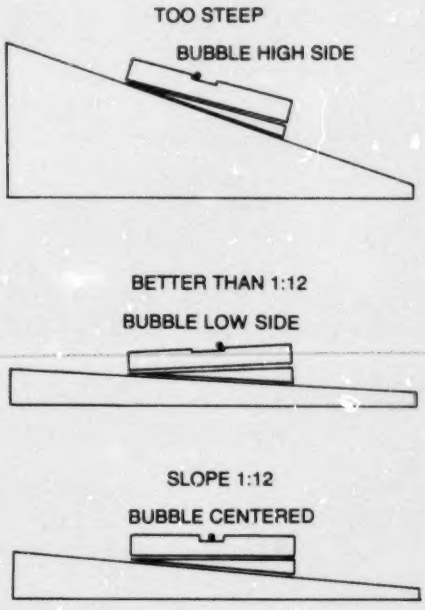
Measuring from Door Face to the Stop



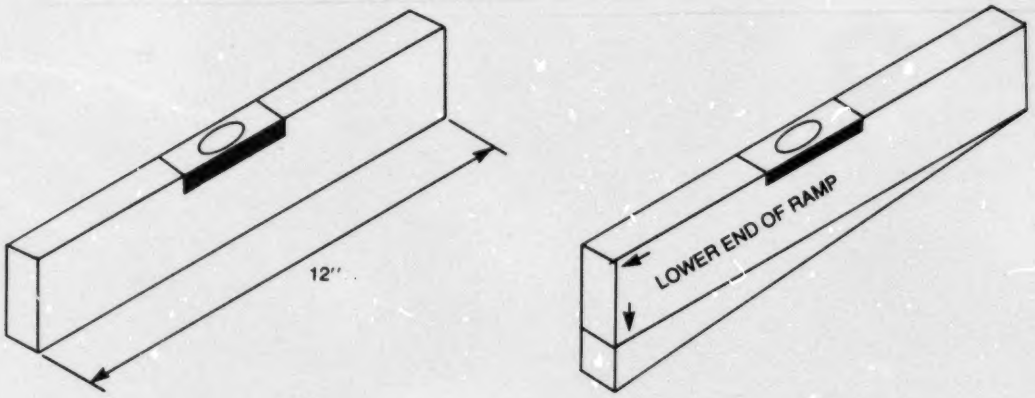
Checking Ramps' 1:12 Slope Requirement



Ramp Slope Check: Items needed: 12 inch long bubble level; piece of wood 12 inches long by 1 inch high and the width of the bubble level; and glue to join the level and the wood.

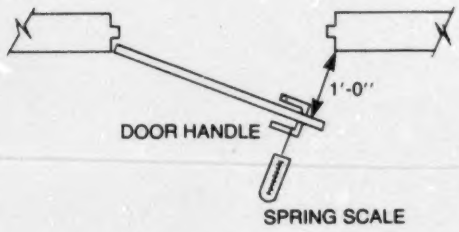
Cut the piece of wood so that 1 inch on 12 inch ramp is formed. Take the level and glue it (as shown) to the 12 inch side of the block of wood. This device can now be used to determine whether an existing ramp meets or exceeds the 1 inch on 12 inch slope requirements.

Bubble Level and Wood Piece



Door Opening Pressure Measure: Items needed are a spring scale (measuring from 0 to at least 10 lb.), and some way of attaching this spring scale to the handles of doors to be checked.

Door Opening Pressure Measure



This device will measure the closing forces created by the door closer foot. Attach the spring scale to the handle of the door open to approximately 1 foot, and at rest. Read the closing force in pounds. The closing force is approximately 60 percent of the force needed to open the door. You must, therefore, multiply this "closing force" by 1.67 to obtain the opening force required for the particular door being checked. Unless otherwise specified by applicable fire-safety codes, an exterior door in the path of travel considered accessible shall not exceed 8 pounds opening force. An interior door shall have a maximum opening pressure of 5 pounds.

lb. closing force × 1.67 =
lb. opening force

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The 60 percent efficiency factor is based on ANSI A156.4 which requires that a door closer must be at least 60 percent efficient.

Tape Measure: A steel measuring tape of at least 6 feet will be necessary to obtain the other dimensions needed for this survey.

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